SEPTEMBER 1, 1947

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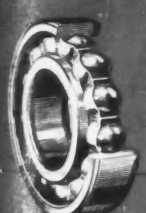

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# AUTOMOTIVE INDUSTRIES

Published Semi-Monthly September 1, 1947 Vol. 97, No. 5



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AUTOMOTIVE INDUSTRIES

Published on the first and 15th of the month

September 1, 1947
Volume 97, No. 5

# Production

*By Julian Chase*

THIS issue of AUTOMOTIVE INDUSTRIES is devoted chiefly to a comprehensive display of new items of production equipment—machines, attachments, accessories and such devices—all designed to increase production and, directly or indirectly, to reduce costs. With things as they are in the world today, such a display, on paper here and in material form at the Machine Tool Show in Chicago, is not only timely, but critically important in the interest of our own country's well-being and the well-being of the world at large.

With obvious correctess competent authorities have repeatedly contended that what the world in its present condition needs most is greatly increased production. How there can be any doubt about it is hard to understand but the deplorable fact remains that a clear and convincing recognition of this vital truth is by no means sufficiently widespread to give it the inspiring and motivating acceptance it should have among all the people everywhere for the good of all the people everywhere.

What is also deplorable, and too close to the tragic, is the fact that so many today are ignorantly, or demagogically perhaps, advocating purely political nostrums for the world's ills. In America we have and have had for more than 150 years the best formula for the stimulation of production that the world has ever known. It is both political and economic, an inseparable merging of the two. It is democracy and free enterprise, each vitally dependent on the other and both together more potent and prolific than any other system ever tried by man.

Nowhere else in the world and at no other time in history has social and economic progress anywhere nearly equaled or even approached that of America since the days of the Founding Fathers. Nowhere at any time has the standard of living of a people as a whole risen so rapidly or so high. There can be no question about it. The records prove it. Why, then, should there be any question as to the long run effectiveness of the system under which such results have materialized? Why should there be any honest doubters? The American system needs only more widespread understanding. It does not need defenders. For our own good and for the good of the world, it does need fully informed and capable explainers.

America knows how to produce and how to increase productivity. Let's look at a relatively recent period in our history. By 1939 we had, in forty years, increased our real national income to nearly three times what it had been in 1899. During the same period, man-hours of labor in production increased only about 40 per cent for, while there was an increase of approximately 75 per cent in number of workers, there was also a decrease of something like 20 per cent in the hours worked. National output per man-hour increased 110 per cent during the period as a result of a cumulative increase of nearly 2 per cent per year. That rate applied

(*Turn to page* 169, *please*)



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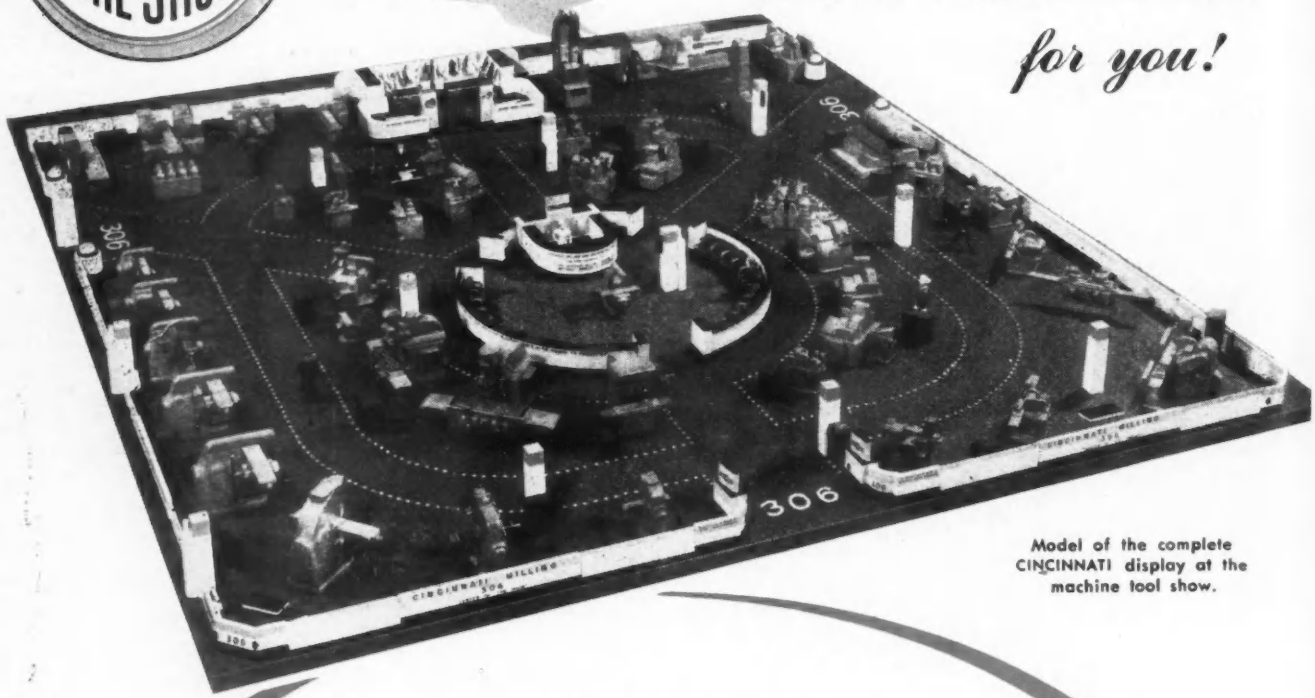


Model of the complete CINCINNATI display at the machine tool show.

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CINCINNATI

*Vol. 97, No. 5*

# NEWS of the AUTOMOTIVE INDUSTRIES

*September 1, 1947*

## Lincoln and Mercury Models To Be Completely New in '48

Although all the publicity so far from Ford Motor Co., has been slanted toward the 1948 Ford as being radically different, it is evident that sweeping changes will also encompass the Lincoln and Mercury. Ford will undoubtedly make his bid for sales supremacy with the Ford car, with an intensive drive also to be made with the Lincoln and Mercury in their respective price classes. Henry Ford II, personally told dealers in Chicago that the 1948 models will be brand new cars from bumper to bumper and from wheels to roof. He said further that the cars will have new engineering throughout and will be "out of this world," indicating extensive styling changes. It is reported that all three lines will have completely redesigned engines in keeping with the most modern engineering developments. The Lincoln will have a new V-8 engine instead of the current 12. Mercury also will have a new V-8 engine and Ford will have a V-8 and an in-line 6.

## Unlikely That '47 Output Will Hit 5 Million Vehicles

The hoped-for five million vehicle year is fading away following the extremely poor showing made in August by the automobile industry. Production figures for the month are expected to show no more than 375,000 vehicles which is slightly below July. The Murray strike, shortages of steel, and several days of hot weather combined to hit production during the month and, with but four months remaining of 1947, there is serious doubt that production this year of even 4.7 million cars and trucks, which was predicted earlier, will be obtained. The substantial improvement in production that had been predicted for the last half of this year failed to materialize during the first two months of that period, and it will take a much greater improvement than is now in prospect to even come within a reasonable distance of the five million mark. Automotive production men are very pessimistic about any worthwhile improvement in the supply of sheet steel for several months, which would mean that 1947 will wind up far short of the original goal.

## Carnegie Clairvoyance?

***Included among the new engineering and design features in this one-quarter scale model of a possible 1949 automobile designed by students at the Carnegie Institute of Technology are a 110 deg windshield angle of vision; a three-sectioned front seat; and a 30 cu ft trunk.***

## New V-8 Car by Ford of Britain

A new eight-cyl, five passenger sedan, the V-8 Pilot, is now being produced by the Ford Motor Co., Ltd., England. The price of the new Ford, the first V-8 to be made in England since before the war, is about $2993, including purchase tax. The new car's engine is rated at 21 hp in England, which is equivalent to 60 hp, U. S. rating.

Because of the steel shortage, the V-8 Pilot will be built in small quantities for the present. The car will have the advantage of the new flat rate tax of £10, coming into effect January next, whereas under the present system its annual tax is £26. With a bore of 2.56 in. and a stroke of 3.75 in., 152 cu in. piston displacement, the engine has a compression ratio of 6.3 to 1 and is said to develop 66 hp at 4000 rpm. The car differs both in style and in mechanical features from the American model. Gear shifting is by a lever on the steering column and an improved transmission has been adopted. A big capacity A.C. external oil filter is fitted, and improvements have been made in the carburetor and intake manifolding Wheelbase is 108¼ in., with a rear track of 58 in. and a front track of 55⅞ in. The Pilot has a four-door welded steel sedan body with opening windshield, luggage compartment accessible from the rear, and spare tire enclosed in the luggage compartment door. Standard equipment comprises car heater, built-in jacks, dual vacuum operated windshield wipers, self-cancelling direction indicators, dual horns, electric clock, accommodation for radio, oil-bath type air cleaner. Upholstery is in leather.

## Chrysler, Hudson, Nash, K-F, And Willys Boost Prices

Following in the wake of recent car price increase announcements, Hudson Motor Car Co. has announced that list prices of its cars would be advanced from $45 to $95. Material and labor cost rises necessitated the increase, it was stated.

Chrysler Corp. increased passenger car and truck prices from $45 to $143 recently. It was estimated that the price increases would average $87 on Plymouth, Dodge, De Soto, and Chrysler passenger cars, and $65 on most Dodge trucks. Willys-Overland Motors, Inc., has raised the price

## Truck Tank by Freuhauf

***The Fruehauf Trailer Co. is now building streamlined truck tanks of 500 to 3000 gal capacity for gasoline and fuel oil delivery. Designed to fit all popular make trucks, the new tanks are of high tensile steel construction, and feature a smoothly contoured outer shell, without bands.***

of its station wagon by $63.34, about four per cent, and its four-wheel-drive truck by $47, or about 3.2 per cent. Willys said that the prices of its Jeep and recently introduced two-wheel-drive truck would be held.

Prices of Nash cars have been boosted from $95 on the "600" series to $168.40 on the Ambassador series, the Nash-Kelvinator Corp. recently announced. President George W. Mason said that it was utterly impossible to absorb increasing labor and materials costs without price raises. An increase of $99 in the price of the Kaiser special was announced recently by the Kaiser-Frazer Corp.

### Ford '48 Engine to Use One-Piece Valve Guide

It has been confirmed that the 1948 Ford engine will use a one-piece tubular valve guide instead of the split type. A company spokesman says that the one piece guide gives better heat distribution, better oil control and an improved fit.

### Chrysler Cyclewelding Brake Linings to Shoes

Chrysler Corp. is using "Cycleweld," an adhesive agent used in combat planes during the war, to bond brake linings to brake shoes for cars and trucks. Increasing braking area 15 per cent and eliminating conventional rivets, Cycleweld theoretically permits wearing brake linings to practically their full depth.

Bonded brakes have been used as standard equipment on the Dodge ½ ton truck for more than a year. Current reports say that bonded brakes are being used on at least one of Chrysler's current models, the De Soto. Chevrolet is currently ironing out production problems preparatory to installing bonded brake linings on its lighter model trucks. If that is the case, a very logical development would be extension of the bonded brake to passenger cars. Some other manufacturers, however, are still not completely sold on the bonded brake in its present state of development, although all admit that probably it is a coming feature.

### B-O-P Plant in Wilmington To Operate in September

General Motors Corp.'s Buick-Oldsmobile-Pontiac assembly plant at Wilmington, Del., completed nearly a year ago, will begin limited production in late September, according to a company announcement. Scarcity of steel and other materials has delayed opening of the plant on schedule. It is expected that at full production about 3000 persons will be employed. Two other B-O-P plants, one in Framingham, Mass., and the other in Doraville, Ga., near Atlanta, are currently nearing completion, but dates of starting operations are still indefinite.

### Chrysler 1st Half Net Over $36 Million

Showing net sales of $648,680,637 for the first six months of 1947, Chrysler Corp. and its wholly owned U. S. subsidiaries had a net profit of $36,122,457 after all deductions,

## New Passenger Car Registrations*

***Arranged by Makes in Descending Order According to the 1947 Six Months' Totals.***

| Make | June 1947 | May 1947 | Six Months Units 1947 | Six Months Units 1946 | Six Months Per Cent of Total 1947 | Six Months Per Cent of Total 1946 |
|---|---|---|---|---|---|---|
| Chevrolet | 59,661 | 62,282 | 316,286 | 55,396 | 20.61 | 11.23 |
| Ford | 44,735 | 46,942 | 255,640 | 107,923 | 16.65 | 21.88 |
| Plymouth | 25,658 | 28,663 | 156,233 | 74,845 | 10.18 | 15.17 |
| Buick | 20,352 | 20,131 | 114,844 | 17,496 | 7.48 | 3.55 |
| Pontiac | 18,201 | 19,288 | 102,154 | 21,260 | 6.66 | 4.31 |
| Dodge | 16,867 | 18,608 | 98,430 | 48,423 | 6.41 | 9.82 |
| Oldsmobile | 14,897 | 16,212 | 90,079 | 16,042 | 5.87 | 3.25 |
| Nash | 8,505 | 9,712 | 54,707 | 32,824 | 3.56 | 6.65 |
| Mercury | 8,454 | 10,232 | 54,362 | 16,297 | 3.54 | 3.30 |
| Studebaker | 8,658 | 9,048 | 50,985 | 15,161 | 3.32 | 3.07 |
| Hudson | 8,670 | 9,274 | 50,058 | 25,581 | 3.26 | 5.19 |
| Chrysler | 7,419 | 8,358 | 44,918 | 23,396 | 2.93 | 4.74 |
| De Soto | 5,549 | 6,424 | 34,389 | 22,474 | 2.24 | 4.56 |
| Cadillac | 4,665 | 4,989 | 25,506 | 5,176 | 1.66 | 1.05 |
| Packard | 3,526 | 3,652 | 21,203 | 8,298 | 1.38 | 1.68 |
| Kaiser | 3,337 | 3,364 | 18,613 | ..... | 1.21 | .... |
| Frazer | 5,003 | 3,336 | 15,135 | ..... | .99 | .... |
| Lincoln | 2,272 | 2,339 | 12,257 | 2,506 | .80 | .51 |
| Willys | 2,049 | 2,341 | 11,300 | ..... | .74 | .... |
| Crosley | 1,319 | 1,457 | 7,428 | 14 | .48 | .... |
| All Others | 66 | 67 | 391 | 187 | .03 | .04 |
| Total | 269,863 | 286,719 | 1,534,918 | 493,299 | 100.00 | 100.00 |

* Data from R. L. Polk & Co.

including a provision of $23.5 million for taxes. In the first half of 1946, Chrysler had net sales of $357,483,190 and a net profit of $4,065,382. A total of 460,252 passenger cars, trucks and commercial vehicles were sold in the first six months of 1947.

## Tucker Corp. to Make 25 More Hand-Built Models

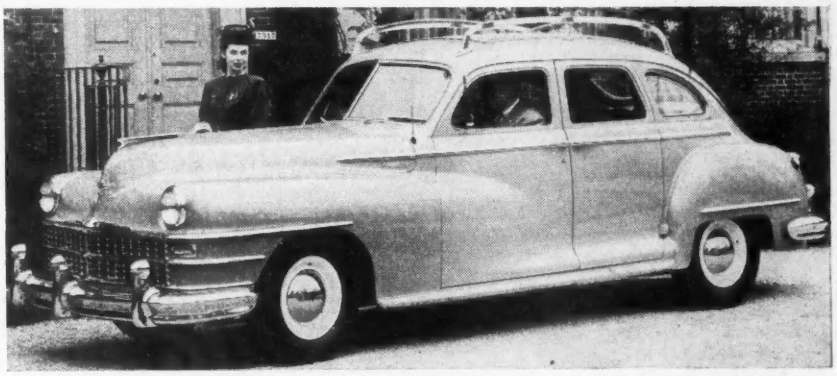
Although the sale of Tucker Corp., stock in late August had not progressed to the point where enough capital was available to meet the WAA requirement of $15 million capital assets, Preston Tucker, president, stated that 25 special models of the new Tucker car are being built and should be completed within 60 to 90 days. He said that the company has requested bids on dies needed for mass production, indicating that 25 cars will be hand built. As of August 20, between 75 and 80 per cent of the stock required to be sold to provide capital, in addition to funds already held by the corporation, had been sold.

## New Car Built by Swedish Airplane Maker

A Saab Two-Stroke is now being produced by the Saab Aircraft Co., Linkopingen, Sweden, which during the war built military airplanes for the Swedish Armed Forces. With completely modern lines, the new car features combined body and chassis construction with a front drive. The engine and the transmission unit are a modified version of the two-cylinder, two-stroke D.K.W. With a speed of over 60 mph, the Saab weighs about 1568 lb and is expected to sell for approximately £350.

## '48 Models May Have Fan Thermostatically Controlled

It is reported in Detroit that several companies are working with a new type engine fan with a thermostatic control. In operation the fan would cut in at a specified engine temperature, and would disengage when the temperature dropped to the low range point. It is believed that in driving at high speed in extremely cold weather, enough cold air would wash in through the radiator to keep the engine operating without the use of the fan. It also would enable the engine to warm up much faster, and would cut down power required to operate the fan, which is said to be a considerable drag on the engine.



## Luggage on Top

***Specifically designed for those needing extra luggage space — campers, hunters, fishermen, and tourists—Chrysler's Traveler model is built on the regular Chrysler Windsor chassis. A luggage canopy of heavy water-repellent olive-drab duck fits into the luggage rack on the roof. Completely covering luggage, the canopy is held in place by eight elastic straps with swivel snaps.***

## Monroe Auto Equipment Tractor Seat Price Down 20%

A price reduction of about 20 per cent in Monroe Auto Equipment Co.'s postwar-developed, easy-ride tractor seat has been announced. Now selling for $29.95, the seat combines variable-rate coil spring, sway bar, and a hydraulic shock absorber for smooth tractor riding.

## New Truck Engine Uses Ford V-8 Parts

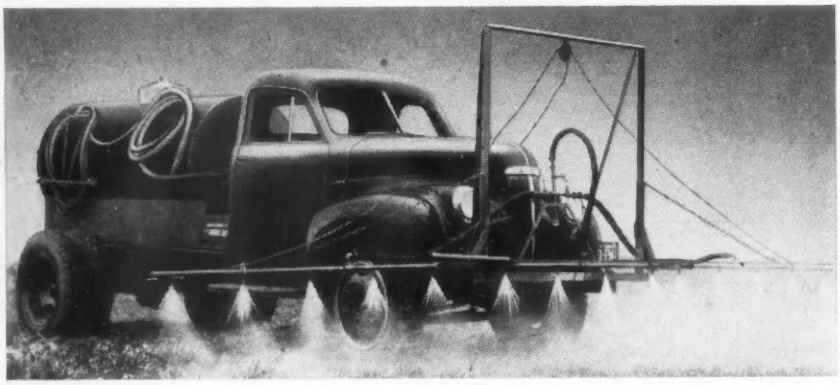
A V-8 truck engine which, it is claimed, can provide high power output at the lowest cost per hp of any automotive engine on the market, has been developed by the Ardun Mechanical Corp., New York, N. Y. Basically, the new unit is a Ford V-8 truck engine which has been modified by the use of an aluminum head with hemispherical combustion chambers, offset spark-plugs and overhead valves. The valves are of larger size, radially inclined, and operated by push-rods and rocker arms. This arrangement can provide a more desirable path for the gas mixture, and results in higher volumetric efficiency. A 100-hp Ford V-8 engine modified in this manner can develop 160 hp at an equivalent operating speed and 175 hp at 5200 rpm, it is reported. The new engine, the result of two years of research, has completed 1000 hr of bench tests, and is expected to go into production within three months.

## New Willys Stamping Plant To Start Operating Soon

Willys-Overland Motors, Inc., is currently assembling cabs and pick-up boxes for its two and four wheel drive trucks in its new body shop at Toledo. In addition, dies, fixtures and other body stamping equipment are being moved to Toledo from the plant of Hayes Manufacturing Co., at Grand Rapids. The stampings for the bodies will be made in Willys' own plant soon. The move is another indication that Willys is attempting to become more self-sufficient. The company's new $5 million body stamping shop is nearing completion, and eventually will make all stampings for the commercial line of vehicles. Major dies will be supplied by vendors but the company also has a die maintenance shop to make smaller dies for new models as well as for die maintenance.

## Suspend Lagonda Production

Production of the 2½ litre Lagonda, designed by W. O. Bentley, recognized as one of the most advanced and promising cars on the British market, has been suspended before any deliveries have been made. Reasons for this step are the imposition of the new purchase tax of 66 2/3 per cent, which made the selling price $8,500 on the home market, and the difficulty of obtaining steel and other supplies under the present control system. There is a possibility that the design may be taken over by another automobile firm, and that the present factory at Staines will be converted for another



## Studebaker Scouges

***The Studebaker truck pictured above was used for demonstration purposes in a campaign against Nebraska bindweed throughout the state recently. Equipped with special spraying equipment, this truck enables one man to cover a vast acreage quickly by merely driving across afflicted fields.***

branch of engineering work. Another car to disappear before it got into production is the French-designed two-cyl Gregoire, which received an immense amount of publicity as "the People's Car." Sponsored by W. D. Kendall, M.P., who at one time was connected with the Budd organization at Philadelphia and who later was with Citroen in Paris, this company has gone into liquidation.

### Ford Shipping Parts Daily To East by Air Express

Although shipment of critical parts and materials by plane is not a new practice, Ford Motor Co., is still heavily involved in air express shipments. Through an arrangement with a small airline, operated by ex-GI's, the company is now shipping quantities of scarce parts and materials from Dearborn to the East Coast, principally to the Edgewater and Chester plants. At least one shipment is made every night and on some nights two transports make the run carrying everything from gas tanks to hoods and glass. The planes are converted army surplus C-47's which carry up to 6000 lb cargo each. On the return trip the airline carries clothing and shoes for Detroit retail outlets.

### Car Makers Consider New Convertible Top Material

New materials for convertible car tops are said to be nearing adoption. The 1948 Packard convertible now contains a substantial percentage of rayon. Chrysler Corp., is said to be seriously considering a woven plastic material to replace the canvas currently used for convertible top coverings.

### Increased Costs May Force Rise in Repair Parts Prices

Service departments of automobile manufacturing companies are being cautious about predicting an increase in replacement parts prices. However, some admit that, if vendors continue to raise costs, prices may eventually go up. They have already absorbed several cost increases on replacement parts, and with steel prices upped sharply, several are wondering how long they can hold the line. Ford's service department reports that certain engine parts such as rings, valves, pistons, and bearings are in much easier supply, and that electrically operated accessories such as heaters also have shown improvement in recent weeks. The company reports that its heaviest volume of service parts business was reached in July of this year although it could give no account for the reason.

### 1948 Hudson Said to Include Radically New Style Changes

According to reports circulating in Detroit, the new model which Hudson will bring out some time this fall is entirely new in styling. Little is known about engineering changes in the car, but they are not expected to be radical.

### Lower Prices Next Year, Car Buyers Say in Survey

Although a recent survey of potential automobile buyers shows a market for more cars than the industry can produce in 1948, 60 per cent of those questioned believe prices will be lower next year. Many indicated they had postponed new car purchases because of high prices. Crowell Collier Publishing Co., which made the survey, said that if the cost of new cars remains high or goes higher a significant number of buyers may defer purchases still further.

### The Independent Production Equipment Show

Acording to the promoters, the independent Production and Machine Tool Show, which will be held in the International Amphitheatre at 43rd and Halsted in Chicago, September

### Shipments of Aircraft Engines and Other Products of Aircraft Engine Plants*

| | May 1947 | April 1947 | Five Months 1947 |
|---|---|---|---|
| **Aircraft Engines** | | | |
| For U. S. Military | | | |
| Number | 387 | 430 | 1,950 |
| Value | $19,495,084 | $17,257,072 | $82,020,575 |
| Parts, Value | $2,971,172 | $2,780,284 | $11,258,284 |
| For Other Than U. S. Military | | | |
| Number | 1,773 | 2,472 | 10,995 |
| Value | $5,008,286 | $6,192,943 | $28,485,734 |
| Parts, Value | $3,088,994 | $3,036,420 | $15,091,766 |
| Total—Engines | | | |
| Number | 2,160 | 2,902 | 12,945 |
| Value | $24,503,370 | $23,450,015 | $110,506,309 |
| Parts, Value | $6,060,166 | $5,816,704 | $26,350,050 |
| All Other Products, Value | $552,961 | $455,460 | $2,705,266 |
| Total Value, Engines and Parts | $31,116,497 | $29,722,179 | $139,561,625 |

* Bureau of the Census and Civil Aeronautics Administration.

## Shipments of Complete Aircraft and Other Products of Aircraft Plants, 1947*

| | May | April | Five Months |
|---|---|---|---|
| Complete Aircraft | 1,740 | 2,143 | 10,095 |
| For U. S. Military | | | |
| Number of Planes | 94 | 105 | 546 |
| Value of Planes and Parts | $37,326,323 | $33,434,597 | $186,290,219 |
| For Other Than Military | | | |
| Number of Planes | 1,646 | 2,038 | 9,549 |
| Value | $19,046,051 | $18,331,640 | $67,882,691 |
| Under 3000 Pounds | | | |
| Number | 1,618 | 2,006 | 9,435 |
| Value | $5,641,249 | $6,518,657 | $31,214,604 |
| 3000 Pounds and Over | | | |
| Number | 28 | 32 | 114 |
| Value | $13,404,802 | $11,812,983 | $36,668,087 |
| Parts for Other Than Military | $1,378,460 | $1,508,015 | $7,403,178 |
| Conversions | | | |
| Number of Planes | 21 | 21 | 117 |
| Value | $2,318,203 | $1,917,123 | $10,649,631 |
| All Other Products; Value | $2,901,181 | $3,314,461 | $13,982,131 |
| Total Value of Products | $62,970,218 | $58,505,836 | $286,207,850 |

* Bureau of the Census and Civil Aeronautics Administration.

17th to 26th inclusive, will comprise about 100 exhibitors of machine tools, presses, welders, die casting machines and other types of production equipment. Because of the late date on which plans for the show were first formulated, no complete official list of exhibitors is available as we go to press. This show will, therefore, be reviewed in a later issue of AUTOMOTIVE INDUSTRIES.

### Kaiser Organization Buys More K-F Stock

Permanente Metals Corp., controlled by Henry J. Kaiser, has purchased 100,000 shares of Kaiser-Frazer Corp. stock from Graham-Paige Motors Corp. Current Kaiser holdings in K-F are now estimated at 470,000 shares, or about 10 per cent of the outstanding stock.

### Swedish Car Maker Buys Many Parts in U.S.

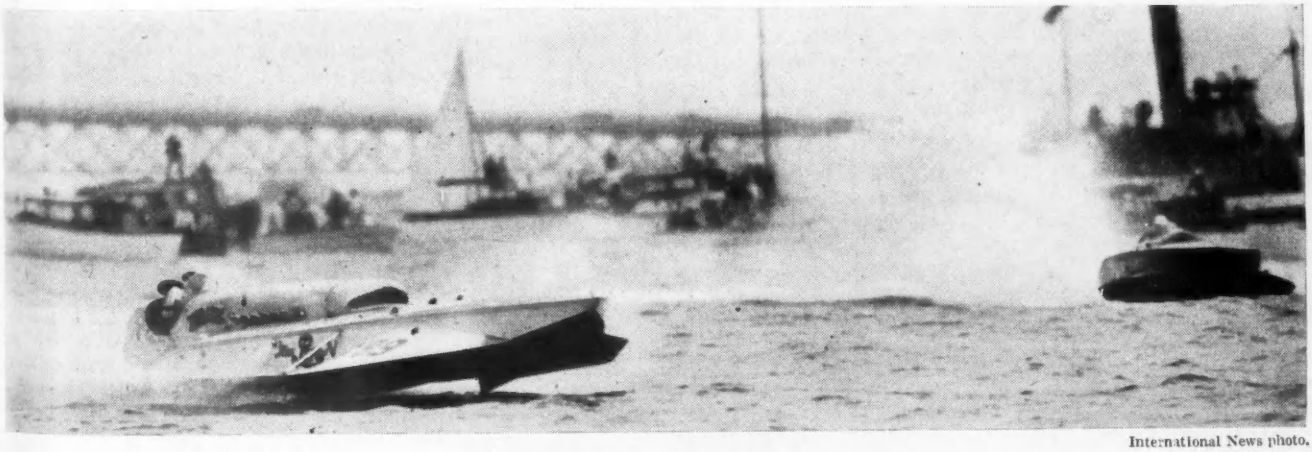
Volvo Co., large Swedish automobile company, has been spending between $60,000 and $100,000 a month in this country for parts and materials. Parts purchased include hubs, wheels, drums, brakes, tires, instruments, radiators, steering gears, body hardware, electrical equipment, shock absorbers, and engine bearings. The company is also endeavoring to buy sheet steel, which it says is superior to the Swedish product for deep drawing. However, export restrictions have hampered purchasing, and the company is greatly limited in its production volume for lack of body steel. Volvo will produce 10,000 vehicles this year in contrast to the 24,000 which had been scheduled.

### Over $2 Million Profit For Hudson in 2nd Qtr. '47

Hudson Motor Car Co. has reported a net income of $2,005,041 after all charges and provisions for taxes for the quarter ended June 30. In the corresponding period of 1946, the company showed an operating profit of $258,032. Net income for the six months ending June 30 was $3,796,266.

### New Zealand Bars Imports Of U.S. Cars in 1948

New Zealand had deferred the issuance of licenses for the importation in 1948 of motor vehicles produced in the United States. Licenses were issued on a reduced basis for the importation of British and Canadian produced automobiles. In addition to the U. S. ban, licenses for the importation of motor vehicles from any country outside of the British Empire was deferred in the new dollar-saving program for 1948.



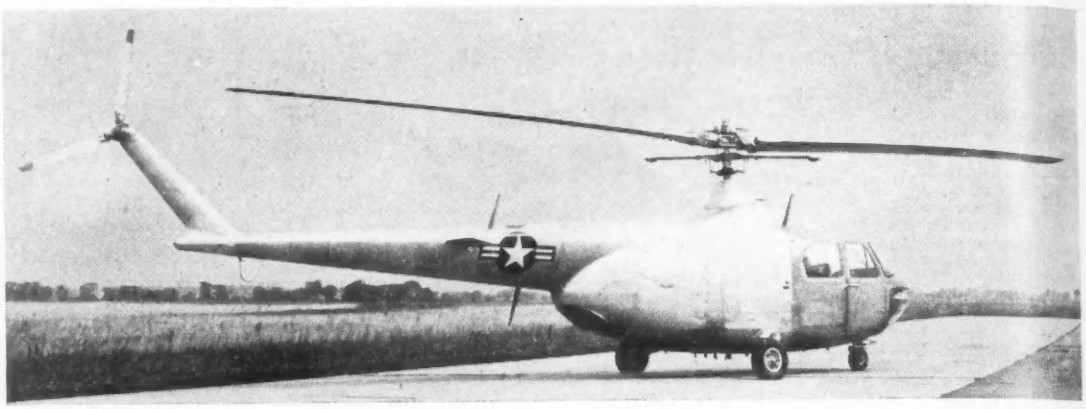
International News photo.

### Gold Cup Winner

***Streaking across Jamaica Bay, Danny Foster, driving Miss Peps V, is shown at the left on his way to victory in the 40th running of the International Gold Cup motorboat classic on August 10. Miss Peps V, powered by an Allison 12-cyl airplane engine developing over 1700 hp, measures 23 ft in length and 10 ft, 7 in. in beam. In three 30 mile heats over a three mile course, Mr. Foster's time and speed for the first, second and third heats was 34.20 min. 52.43 mph; 32.09 min, 55.96 mph; 31.58 min, 56.25 mph.***

## Test XR-12

***Built by Bell Aircraft Corp., this new five-place helicopter, the XR-12, is now undergoing preliminary tests for the AAF. Reported to be capable of climbing vertically at the rate of 450 fpm, the XR-12 has a top speed of 105 mph and a cruising speed of 90 mph.***



## Lincoln-Mercury Div. Splits Parts and Service Activities

In order to provide improved parts and service facilities for the Lincoln-Mercury Div., the parts and service department will be divided into two sections, according to Joseph E. Bayne, general sales manager. A separate parts and accessory department, distinct from its service department, has been set up with a merchandising goal of $40 million of parts and accessories in 1948. The new department will be headed by E. A. Erickson. Glenn H. Schricker will continue to direct the service section.

## Report GM Interest in Ferguson Cleveland Plant

Speculation about what Harry Ferguson, Inc., intends to do with the former Cleveland Pneumatic Aerol plant it purchased from WAA for the manufacture of tractors has been partially answered by a report that General Motors Corp., is interested in the plant. GM has admitted considering the plant, but says that it is only one of several it has under consideration. It also has declined to comment on what use might be made of the facilities if acquired. Ferguson purchased the plant last March for an estimated $1.9 million, but gave up the plan for tractor manufacture there when it withdrew a proposed stock issue.

## Test New Bell Helicopter

Now being tested, Bell's XR-12 is powered by a Pratt and Whitney nine-cyl, air-cooled engine rated at 550 hp. Designed for observation, liaison and evacuation, the XR-12 is reported to have a top speed of 105 mph; a cruising speed of 90 mph; a service ceiling of 13,000 ft; a hovering ceiling of 4350 ft; a range of 300 mi; and a vertical climbing rate of 450 fpm. Carrying a useful load of 1630 lb with a normal gross weight of 5803 lb, the new helicopter has a two-bladed main rotor system, 47 ft, 6 in. in diam, which is used with a gyroscopic action stabilizer bar. This latter, weighted at each end, is attached to the hub at right angles to the blades to give greater stability to the blades and to decrease vibration.

## Northrop to Be Awarded St. Louis Medal by ASME

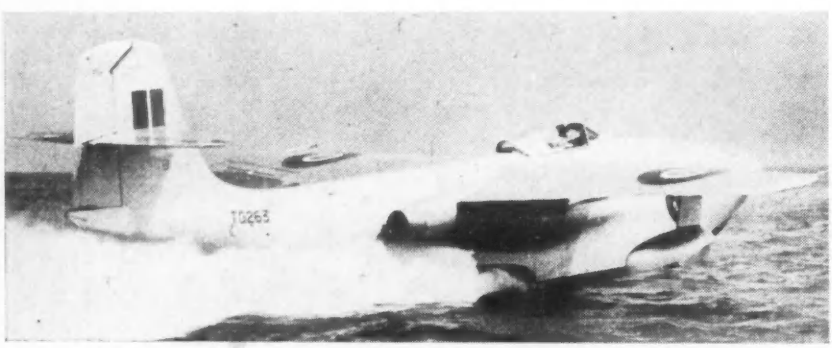
John K. Northrop, president, Northrop Aircraft, Inc., will receive the Spirit of St. Louis Medal, the highest aviation honor of The American Society of Mechanical Engineers for his development of the Flying Wing, and for other contributions to aeronautical science. The medal will be awarded on the evening of September 3, at a banquet highlighting the ASME's annual fall meeting in Salt Lake City, September 1-4.

## Thermomotor-Co. to Make Philips' Hot Air Engine

The Philips' hot air engine, described in the Aug. 15th issue of AUTOMOTIVE INDUSTRIES, is going to be manufactured by the Thermomotor-Co., Eindhoven, Holland. This company was established by the N. V. Philips' Gloeilampenfabrieken, Eindhoven.

## Dr. Stockdale to Speak at Body Engineers Convention

The technical sessions to be held at the American Society of Body Engineers' Annual Convention to be held in Detroit, Nov. 5-7 will cover styling, production engineering, small cars, seating comfort, truck bodies, buses and coaches, materials in body construction and passenger car and body engineering. The principal speaker at the open house to be held on the evening of the first day is Dr. Allen A. Stockdale who will appear through the courtesy of the National Industrial Information Com-



## Swashing on the Solent

***The world's first jet flying boat fighter is shown on the Solent near England. Built by Saunders-Roe at their Isle of Wight plant, twin jets are reported to give the new plane a speed over 400 mph. International News photo.***

## French War Bird

*The latest is modern military helicopters is this new streamlined addition to the French Army's Air Arm, shown parked on an Army airfield. Acme from French Army photo.*

mittee of the National Association of Manufacturers.

# Labor

### Murray Negotiations Show High-Handed Union Stand

An excerpt from the transcript of negotiations between the UAW-CIO and Murray Corp., reveals clearly the union's position on the liability provisions of the Taft-Hartley Act. According to the official record released in a large newspaper advertisement by C. W. Avery, president of Murray, a union spokesman stated "We want a company guarantee that there will be no law suits of any kind or even a threat of a law suit. To put our position simply and bluntly, what we are saying is, in order for us to operate your plants, you will have to agree you will not sue the union under the provisions of the Taft-Hartley bill . . . even though that is the law of the land, we have got to agree you are not going to use a law of the land." The union spokesman further stated that the union was unwilling to settle the issue with Murray on the same basis as agreed to with Ford Motor Co.

### Packard Unit of FAA Leaves National Body

The Foremen's Association of America has received another demoralizing blow following its recent defeat at Ford Motor Co. The FAA chapter at Packard Motor Car Co., recently voted unanimously to withdraw from the organization to become a strictly independent bargaining unit at the company. The local organization will attempt to reach an amicable agreement with Packard on some type of collective bargaining contract. In addition to the Packard unit, several national officers and representatives have resigned from FAA and the membership is estimated now to have dropped to between 1000 and 2000 foremen. Highest membership claimed for the organization was 45,000 in 1945.

### UAW Strikes at Gemmer

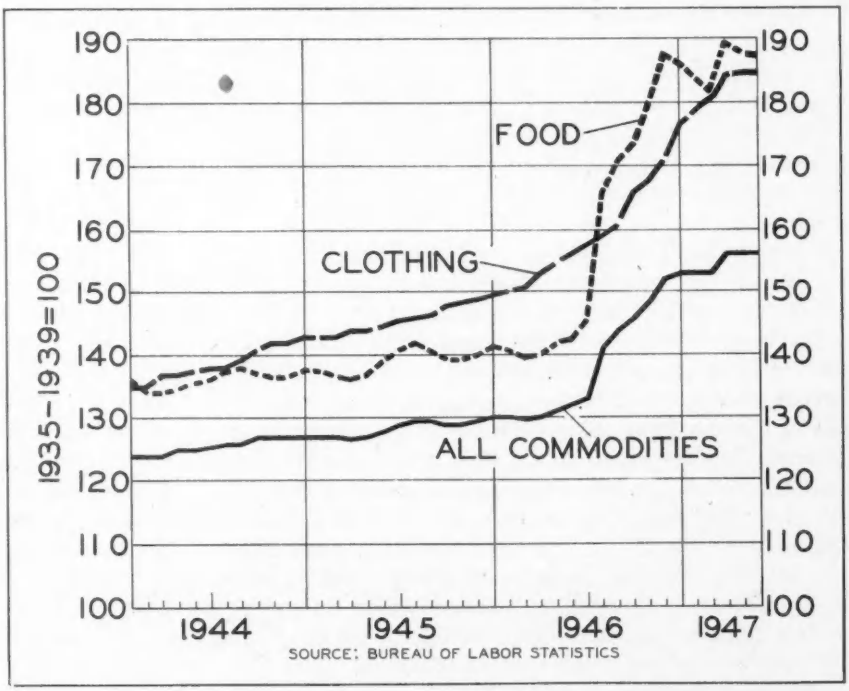
Gemmer Gear Co., producer of automotive steering equipment, was shut down by a strike of the UAW-CIO August 13 in a dispute involving liability for law suits under the Taft-Hartley Act.

# Metals

### Copper

Negotiations with the union seem to preclude the possibility of any strikes which might affect domestic copper production. Copper supply is still running short of demand; although wire mills still can not get enough copper for optimum output, however, brass mill requirements are currently being satisfied. That original predictions of an early surplus copper market were optimistic is reflected in the tendency of the price of copper futures to approximate the current price.

(*Turn to page* 188, *please*)




**Index of Leading Cost of Living Items**

## Table I—Shipments of Machine Tools by Major Types, 1946

| Major Type | Number of Companies[1] | Shipments | | Percent of Total Value of Shipments |
|---|---|---|---|---|
| | | Number | Value (dollars) | |
| TOTAL | 344 | 181,051 | 327,221,598 | 100.0 |
| Boring machines | 39 | 1,888 | 27,454,486 | 8.4 |
| Broaching machines | 7 | 573 | 4,657,006 | 1.4 |
| Drilling machines | 51 | 26,704 | 33,969,624 | 10.4 |
| Gear cutting and finishing machines | 17 | 1,852 | 17,870,363 | 5.5 |
| Grinding and polishing machines (except gear tooth grinding, honing, lapping, and buffing) | 128 | 55,632 | 54,351,909 | 16.6 |
| Lathes | 84 | 53,284 | 103,452,908 | 31.5 |
| Milling machines | 68 | 10,857 | 41,367,417 | 12.6 |
| Planers | 6 | 206 | 4,852,734 | 1.5 |
| Shapers (except gear shapers) | 16 | 2,110 | 7,158,841 | 2.2 |
| All other machine tools[2] | 117 | 27,945 | 32,086,310 | 9.8 |

[1] Number of Companies: The number of companies shipping machine tools is less for the total line than the sum of companies shipping individual major types since some producers ship more than one major type of tool.

[2] Combined the following categories of machine tools: (1) centering machines (2) keyseating and slotting machines (3) sawing and cut-off machines (4) contour sawing and filing machines (5) tapping machines (6) threading machines and (7) all other machine tools, which includes planers other than double housing and openside; rifle-working machines; chamfering machines; facing machines; automatic roller cut-off machines; special drilling and tapping machines; horizontal processing machines; special transfer machines; special cylinder block facing machines; special axle cut-off and centering machines; special axle-end-facing machines; and other specially designed machines involving combinations of two or more processes, such as boring, reaming, drilling, facing, turning and counterboring.

Source of Data: Bureau of the Census.

# More and Better

INDUSTRY is faced with the problem of producing more goods while at the same time struggling against increasing expenses. It is obvious that increases in the cost of production are eventually passed on to the consumer. This means that if costs of production are permitted to spiral higher, selling prices will need to be set correspondingly higher and so make many goods unattainable to a great number of consumers. With such an economic imbalance, mass consumption and mass production are incompatible.

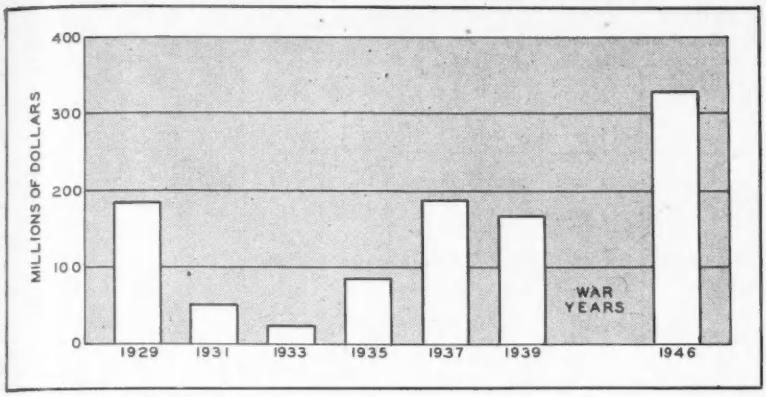
Since increases in individual productivity have not kept pace with increases in wages, the only recourse to industry, therefore, is greater mechanization. If output is to be raised, the application of more automatic machines and power-driven tools is imperative. Production processes will have to be planned to take advantage of automatic machine tools thus transferring the responsibility for more production from the man to the machine. Machine tool designers are working to this end. They are looking ahead, anticipating long range objections. With the trend toward simplicity of operation, increased output with better quality, and more automaticity, machine tool designers and production engineers are meeting a real challenge.

The volume of machine tools shipped in 1946 was greater than for any peacetime year. According to Bureau of the Census, Department of Commerce, the value of machine tools shipped by 344 companies during that year was $327.2 million. The average monthly value of shipments was $27.3 million or nearly twice the average monthly value for 1939. Average monthly shipments for the first four months of 1947 are about the same as the average monthly shipments for 1946.

Fig. 1 shows yearly dollar volume of machine tool shipments for six alternate years preceding the war and for 1946, the first full postwar year. Excluding the war years, the trend in yearly dollar volume of machine tools has been upward since the low of 1933. From 1933 and 1939, the value of shipments almost quadrupled. The peak year before 1933 was 1929 with a dollar volume of $185 million. It is interesting to note that the decline from 1929 to the low of 1933 is about in inverse ratio to the rise from 1933 to 1939.

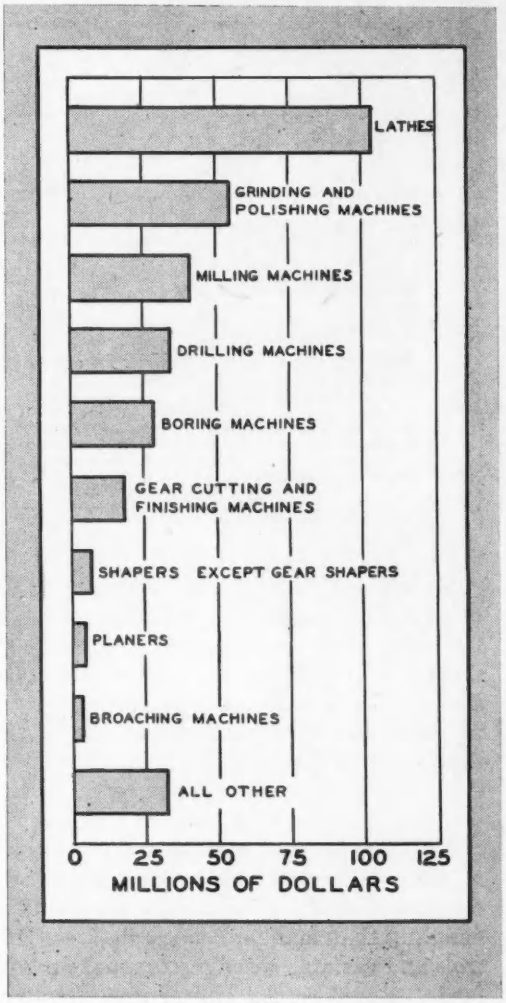
During 1946 the greatest volume of shipments was in lathes, the total value amounting to over $103 million or almost one-third of all machine tools for that year. The next highest group was grinding and polishing machines with a value of 54 million, one-sixth of the total. Milling machines accounted for $41 million, or one-eighth of the total. These three groups represent about 60 per cent of the total value of machine tools shipped during 1946. A breakdown of the shipments of the various types of machine tools in 1946 is given in Fig. 2 and Table I. The term

**Fig. 1—Dollar Volume Shipments of Machine Tools for Peacetime Years**




This chart, comprising the dollar volume shipments of machine tools for six alternate years preceding World War II and for 1946, the first full year following the war, graphically portrays the peacetime growth of the machine tool industry. Values for 1946 and 1939 are Bureau of the Census data. Other values are from reports of the National Machine Tool Builders Association.

**Fig. 2—1946 Dollar Volume Shipments of Machine Tools by Major Types**




Source of Data: Bureau of the Census. See Table I.

# Machines

***In This Article Are Presented Highlights of Modern Advancements in Mass Production Equipment and Techniques Which Make Possible Lowered Costs, Improved Quality, and Increased Rate of Production***

***By George W. Hoehler***

"machine tools," as used here, comprises all power-driven metal working machines not capable of being operated while held in the hand, having one or more tool and work holding devices, and used for progressively removing metal in the form of chips, turnings, borings, etc. While not specifically covered by this definition, honing machines, lapping machines, and grinders are considered to be machine tools. Rebuilt machine tools and machinery used for shaping, pressing, or forging of metal, where the shaping action of such machinery is not dependent on a cutting tool, are excluded as are machine tools specifically designed for home workshops, model makers, garages, and service shops. In Table II are compiled the average monthly shipments of machine tools by major types for 1939, and the years 1942 to 1946, inclusive.

Many improvements are being incorporated in modern machining techniques. The field is so broad that it is impossible to discuss fully in this brief article the myriad of modern mechanized facilities now available. Some of the trends with a few examples will be cited. An excellent picture of what machine tool builders have to offer and what the future may bring forth may be seen at the Machine Tool Show at Chicago from September 17 to 26.

# Table II—Average Monthly Shipments of Machine Tools by Major Types, 1939, 1942-1946

*(In thousands of dollars)*

| Major Types | 1939 | 1942 | Monthly Averages 1943 | Monthly Averages 1944 | 1945[1] | 1946 |
|---|---|---|---|---|---|---|
| TOTAL | 13,887 | 110,146 | 98,351 | 41,454 | 38,126 | 27,268 |
| Boring machines | 1,180 | 11,456 | 8,592 | 3,693 | 4,202 | 2,288 |
| Broaching machines | 191 | 752 | 626 | 263 | 317 | 388 |
| Drilling machines | 1,031 | 8,644 | 7,895 | 3,885 | 3,255 | 2,831 |
| Gear cutting and finishing machines | 937 | 4,322 | 4,551 | 2,413 | 1,635 | 1,489 |
| Grinding and polishing machines (except gear tooth grinding, honing, lapping, and buffing) | 2,523 | 17,445 | 19,023 | 7,119 | 6,202 | 4,529 |
| Lathes | 4,176 | 37,938 | 34,222 | 14,065 | 13,384 | 8,621 |
| Milling machines | 2,018 | 20,519 | 16,058 | 5,918 | 5,058 | 3,447 |
| Planers | 374 | 2,494 | 1,738 | 913 | 1,049 | 404 |
| Shapers (except gear shapers) | 158 | 6,576 | 5,646 | 3,185 | 3,024 | 597 |
| All other machine tools[2] | 1,299 | | | | | 2,674 |

[1] Based on reports for January through July only.
[2] See footnote 1, table 1.

Source of Data: 1939—Census of Manufactures. These data represent value of production; data on value of shipments were not collected. Over a period of a year the two are quite close for machine tools. 1942-1945—War Production Board. Only machine tools valued at $350 or over are included. Machine tools with a value of less than $350 accounted for less than 5 percent of the total value of shipments in those years. 1946—Bureau of the Census annual form M34A.

Coverage: The coverage of data for the years 1942-1945 is: 1942-June 1944—Practically 100 percent coverage with approximately 375 companies reporting. July 1944-July 1945—At least 95 percent coverage with approximately 200 companies reporting. For 1939 and 1946, the coverage is virtually complete.

Machine tool users are asking for controls that are more readily accessible for servicing. The demand is for flush type controls that are an integral part of the machine instead of indifferently placed gadgets. One machine tool user asks, "Why streamline the machine and then make it necessary to hang on all the electrical stuff?" High machine speeds and feeds make mandatory more power, greater rigidity, better wearing surfaces and improved safety features.

Interchangeable tool heads are gaining prominence as a means to reduce machine idle time. New principles in automatic chucking and clamping permit faster handling than manual holding devices. Hydraulic controls and variable speed motors make possible increased feeds. Rapid return and approach reduce non-cutting time.

There are refinements and wider applications of multiple spindle machines; a recently-introduced three-spindle lathe incorporates a radically new principle in turning operates automatically through 39 different functions. There is a 29-spindle drill machine which drills automatically approximately 3700 holes of less than 0.25 in. diam in plates with a shape approaching an ellipse about 13.75 in. by 25.25 in. This machine is equipped with a method for automatic spindle selection synchronized with the indexing of the work table. Some lathes are being equipped with dual driving mechanisms which combine normal low speed turning ranges with the higher speeds demanded for carbide tool application.

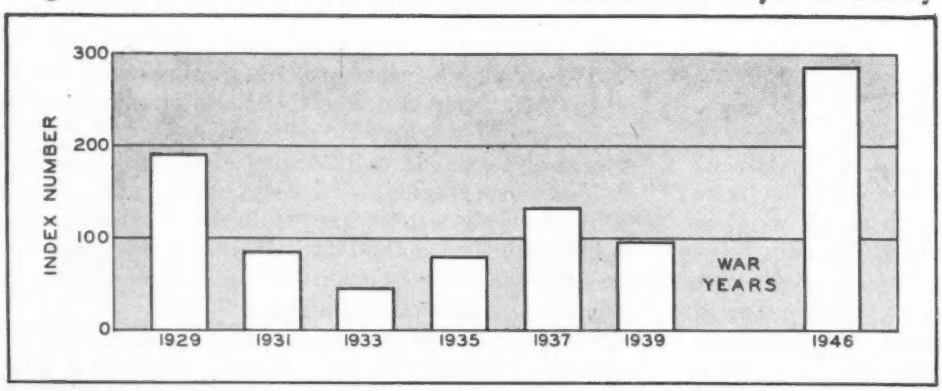
One of the outstanding developments in the trend toward complete automaticity is the transfer machine line in which practically every operation is performed by a series of machine tools joined by automatic transfer devices. One such set-up has 24 different stations, extends about 1000 ft and includes a variety of machining, drilling and tapping operations.

High speeds and feeds have been reported for milling operations where carbide inserted tooth cutters are used. It is now possible to mill cast steel at a cutting speed of about 300 fpm with a feed rate of 17 ipm and cast iron at about the same surface foot rate but at a feed of 22 ipm. Steel weldments are being milled at cutting speeds of approximately 55 fpm with a feed rate of 25 ipm. For the milling of magnesium and aluminum the rates are considerably higher. These light metals are being cut at a surface speed rate of 12,100 fpm with a feed rate of 300 ipm.

A unique machine for cutting external spur and helical gears is a planetary gear shaper that employs a large gap-type, reciprocating, non-rotating cutter around which the work moves. Individual work

(*Turn to page* 170, *please*)

**Fig. 3—Peacetime Growth of the Mechanical Conveyor Industry**




Source of Data: Conveyor Equipr[illegible] Manufacturers Association. Dollar Volume Index Number 100 = 1935-1938 avg.

# NEW MACHINE TOOLS and PRODUCTION EQUIPMENT

ON THE following pages, individually described and illustrated, will be found an imposing array of new machine tools and other items of production and plant equipment all gathered expressly for presentation collectively to the automotive industries* in this Machine Tool and Production Equipment Issue. Included are new products of machine tool builders and new products of makers of production accessories and attachments which will be seen at the great show in Chicago. Included also, for the special benefit of the readers of AUTOMOTIVE INDUSTRIES—production men, engineers and manufacturing executives in automotive plants of all kinds—are new products of other makers of production equipment who will not exhibit at Chicago. Altogether there is here, therefore, a Machine Tool and Production Equipment Show in Print—a truly comprehensive collection of tools and machinery embodying the latest ideas for increasing output and cutting costs.

* For a list of the automotive industries see next page.

NEW
MACHINE TOOLS AND
PRODUCTION EQUIPMENT

*A List of Exhibitors in the 1947 Machine Tool Show Appears on Pages 124, 126 and 128*

**The Automotive Industries**

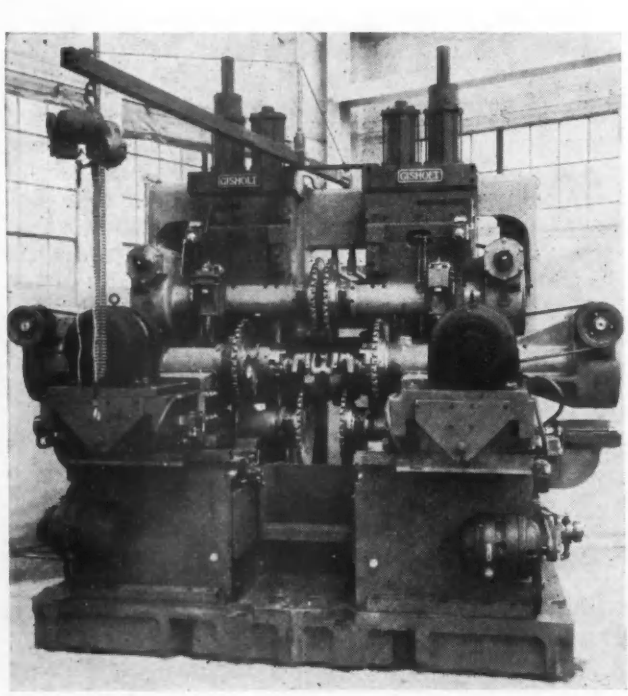
- Passenger Car Industry
- Motor Truck Industry
- Motor Bus Industry
- Tractor Industry
- Agricultural Machinery Industry
- Roadworking Machinery Industry
- Tire Industry
- Automotive Production Equipment Industry
- Aircraft Industry
- Gasoline Engine Industry
- Diesel Engine Industry
- Marine Engine Industry
- Automotive Parts Industry
- Automotive Accessories Industry
- Petroleum Industry
- Automotive Shop Equipment Industry

## E-46—Crankshaft Turn Milling Machine

Gisholt Machine Co., Madison 3, Wis. Special new turn milling machine design to turn mill simultaneously all the crankpins and face the adjacent cheeks and counterweights on a crankshaft to a finish ready for grinding.

In operation, the machine's two headstocks — which together with their respective multiple master cams are driven in unison from a common drive — rotate the crankshaft. Each cam, mounted rigidly to a work rotating spindle, controls the movement of three 24 in. diam milling cutters through hydraulic means acting on the cutter slides. The six crank pins are each turn milled by one of the cutters which is driven through worm gearing by its own 25 hp motor.

The slides, moving in unison with the master cams, follow the crankpins around their orbit while the crankshaft is rotated around its main axis.



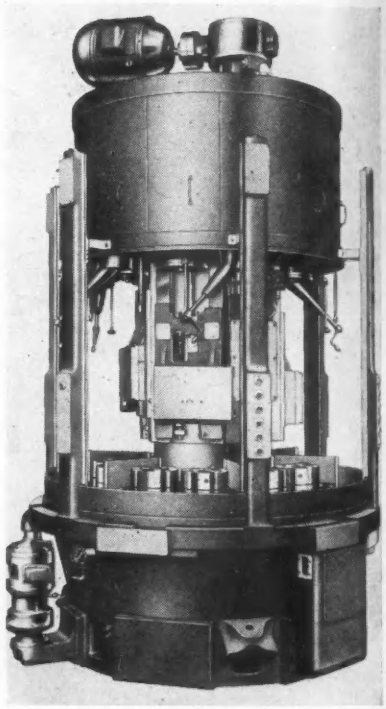

*New Gisholt turn-milling machine for crankshafts.*

Four of the cutters move only in a vertical plane, the other two in a horizontal plane; these latter also have a sidewise movement to facilitate loading and unloading.

Nine separate motors are employed in the construction and operation of this turn mill, comprising a total of 163 hp. There are six 25 hp motors, one to drive each of the cutters. In addition there are two five hp pump motors and a three hp motor for rotating the work.

## E-47—Multiple-Spindle Machine Tool

The Bullard Co., Bridgeport 2, Conn. Type K Mult-Au-Matic high-speed multiple-spindle machine tool. This machine is available in units with six, eight, twelve or sixteen spindles operating at



*Bullard Type K Milti-Au-Matic*

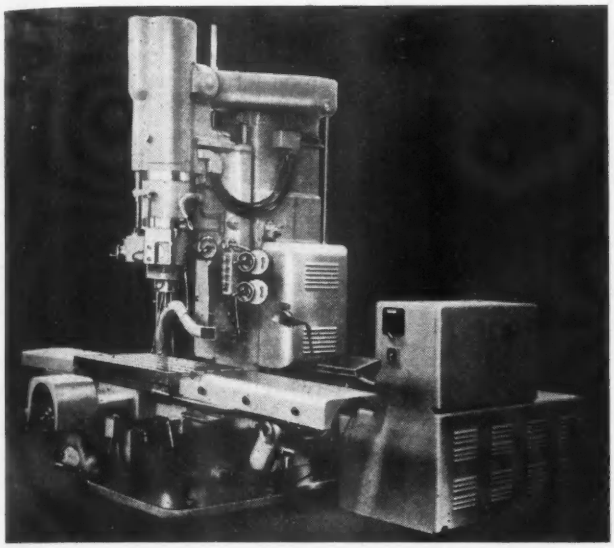
speeds up to 900 rpm. It offers semi-automatic chucking, and adjustable stroke of slides for varying work heights.

The 15-ton six or twelve-spindle model has speeds from 100 to 900 rpm; and the 21-ton eight or sixteen-spindle machine offers 98 to 883 rpm. All models have 41 speed changes and 82 rates of feed available, with selective feeds and common speeds at all stations for high-speed output. Also, the time between cuts is further reduced by a new indexing cycle control.

The semi-automatic chucking feature consists of a foot control which simultaneously closes the jaws and unlocks the indexing mechanism, thus leaving the operator's hands free. The work-holding device is released automatically at the unloading station.

## E-48—Jig Grinder

Pratt and Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn., No. 2C jig grinder. The manufacturer states that this machine is the equal of a jig borer for locating and spacing precision, and that it can remove stock rapidly and finish grind holes to precision limits. It has capacity to handle a wide size range of work with a table surface 22 in. by 44 in., a 36-in. longitudinal travel and an 18-in. transverse travel.



*Pratt & Whitney No. 2C jig grinder*

The bed, table and locating mechanisms are similar to a jig borer. The same measuring instruments are used for spacing—end measures, "tenth" inside micrometers and dial indicators to control measuring pressure and to give a visible check on spacing precision. All slides and measuring instruments are completely protected by hinged guards that swing up to provide easy access while setting.

The No. 2C jig grinder differs from a conventional bore grinder in that the work does not revolve. The grinding wheel head has an adjustable circular motion about the vertical axis of the hole being ground, and may be fed outward in an increasingly larger radius until the hole is finished to size.

The main spindle is mounted in heavily preloaded precision ball bearings and is driven by a ¾ hp 1200 rpm motor through a variable drive. This produces spindle speeds from 35 to 200 rpm for the adjustable circular motion. A separate ½ hp 900 rpm reversing motor and variable drive provides power for the spindle vertical travel. Jog buttons, limit switches and adjustable dogs are provided.

The grinding wheel is mounted in either of two wheel heads furnished with the machine. These wheel heads have built-in sleeve type motors, the rotors of which are assembled directly on the wheel spindles. They may be interchanged quickly by unscrewing them ⅓ turn. Each head has eight speeds. The smaller ones, used for holes up to one in., have speeds ranging from 13,200 to 54,000 rpm. The larger head, used for holes from one in. to five in. in diameter, has speeds ranging from 6600 to 27,000 rpm. These motors are jacketed for air circulation for cooling. The air is filtered, lubricated and pressure controlled by a separate unit mounted at the rear.

The main head has a 15 in. travel on the column face, plus a spindle vertical travel of six in. In addition, there is an angular adjustment for grinding tapered holes up to five deg included angle. A suitable dust collector is furnished with the machine.

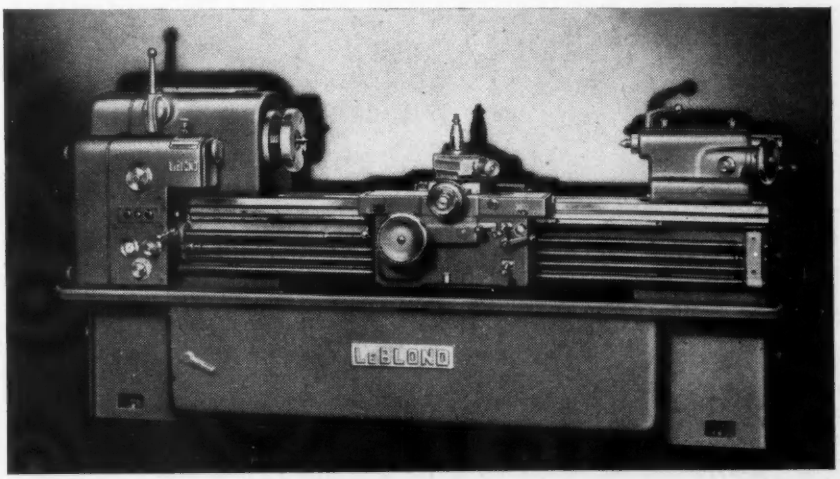
## E-49—Heavy-Duty Lathe

The R. K. LeBlond Machine Tool Co., Cincinnati, Ohio. Model RT 16-in. heavy-duty lathe with single lever control head. This new lathe offers 16 spindle speeds, many of which are in the carbide range. It is built with many visual checks for producing more accurate work.

The 16 spindle speeds, ranging from 20 to 1025 rpm, or 30 to 1537 rpm, are all shifted by a single lever fitted with a guiding arrow which works in connection with a direct reading plate. Also provided on the machine is a universal power rapid traverse which moves carriage, cross slide and tailstock electrically. A single lever on the apron controls all movements of the carriage and cross slide, and a plunger on carriage picks up the tailstock and pulls it in either direction.

This new model contains a combination gear and belt drive with hardened and ground steel gears throughout. The spindle is mounted on two tapered roller bearings and one straight roller bearing. The quick change box is totally enclosed, built with heat-treated gears mounted on anti-friction bearings, and provides 60 changes of feeds and threads without change gears. Other features include an L-shape bed which extends under and supports the entire headstock base; heavy duty lathe one-piece apron with positive jaw feed clutch; streamlined tailstock with direct-reading spindle barrel travel dial; flame-hardened and ground-steel bed ways front and rear; automatic lubrication in headstock, feed box, and apron; and accurately graduated dials, gauges and indicators.

The LeBlond Machine Tool Co. has also introduced a 16-in. model RT heavy-duty lathe with variable speed headstock, a 25-in. heavy-duty engine lathe, and a dual drive lathe.




*LeBlond 16-in. model RT heavy-duty lathe with single lever control headstock*

NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

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## E-50—Multiple Spindle Bar Automatic

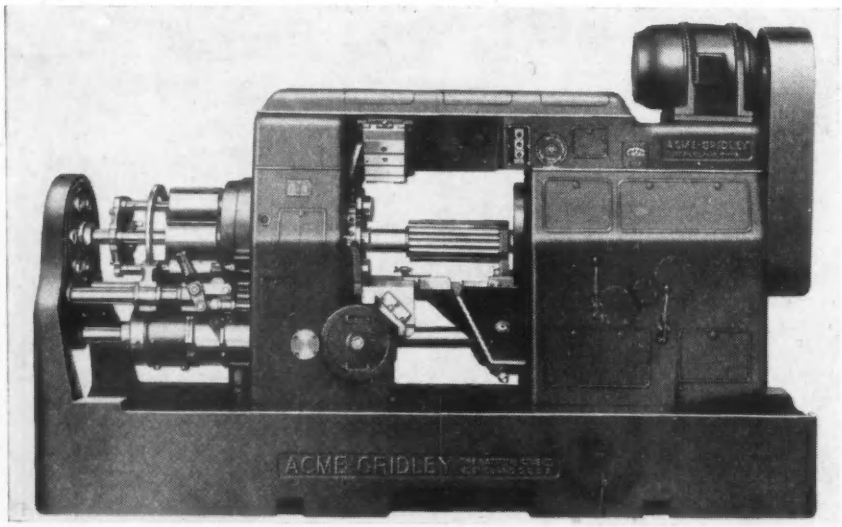
The National Acme Co., 170 E. 131 St., Cleveland 8, Ohio. Model RB Acme-Gridley 1¼-in. multiple-spindle bar automatic. This machine features a box-type frame of heavier construction than its predecessor, broader use of attachments, increased area of tooling zone, interchangeable speed and feed gears, automatic chip conveyor disposal, and automatic devices for visual control.

The gear box is front bored for the installation of independently end operated attachments in all spindle positions. The driving mechanism is heavier. The headstock is also heavier and with increased bearing surface for the spindle carrier. The lower forming side slides, are the angular type supported back into the main frame section without overhang and operated directly by drums and cams through rolls. With this construction these forming slides can be adjusted by one gib and made any width required to accommodate tools for the class of work at hand. The space between the headstock and gear box has been lengthened.

The machine is provided with a top section of the same general design as that on machines of larger capacity up to 7¾-in. This top drive consists of a drum shaft assembly directly connected through the headstock to the main drum shaft by vertical shaft and gears to operate the top slides in the third and fourth spindle positions and the side intermediate slides in the second and fifth positions. It also provides a cam drum to control separately threading attachments in the third and fourth positions. In the top section and in the intermediate slide control, drums and cams are located directly behind the slides, resulting in a chatterless steady feed for the slides. Each slide is independently cammed. The top frame section has an adjustable motor base.

A new type threading attachment (plain or universal) controlled from the top drums employs an adjustable lever for independent control of movement of the die slide with the follow-up cam for the different threading pitches. This affords independent movement for the fifth and second positions threading attachments as may be required. Other attachments can be applied either in third or fourth position without interfering with the drive of the fifth position die spindle.

Other features include a new receding-type stock stop which provides for tool and chip clearance and is designed to permit the operator to pull the stop sidewise; and a power watt meter which registers power consumption for different set-ups.




*Model RB Acme-Gridley 1¼-in. bar automatic*

## E-51—Universal Oscillating Grinder

The Gear Grinding Machine Co., Conant Rd. and G.T.R.R., Detroit 11, Mich. The Geargrind, Type OG-9x6 universal oscillating grinder for finishing spherical, conical and cylindrical surfaces on small parts.

*Geargrind Type OG-9 x 6 universal oscillating precision grinder*

The work head of this machine is driven by a ¼ hp 1800 rpm motor. Step sheaves in the V-belt drive enable three speeds to be used: 110, 230, and 360 rpm. The work head spindle may be equipped with collets, chucks or face plates. Adjustments provided allow the work head to be positioned parallel and normal to its axis of rotation.

For spherical surfaces, the work head is mounted on a table which can be oscillated by hand thru a 180 deg arc, or power oscillated from 0 to 90 deg arc length. On the motor shaft is mounted a step sheave having an integral brake drum. Coincident with the rotation of the oscillating drive motor, the brake is energized to hold in released position. As soon as the motor current is cut off, the brake is released to stop its rotation. The oscillating drive can be disconnected by moving a conveniently placed operating lever. The entire oscillating work head and table are supported on a vertical spindle, which is mounted in taper-roller bearings so that accurate spherical work can be generated by the grinding wheel. The work

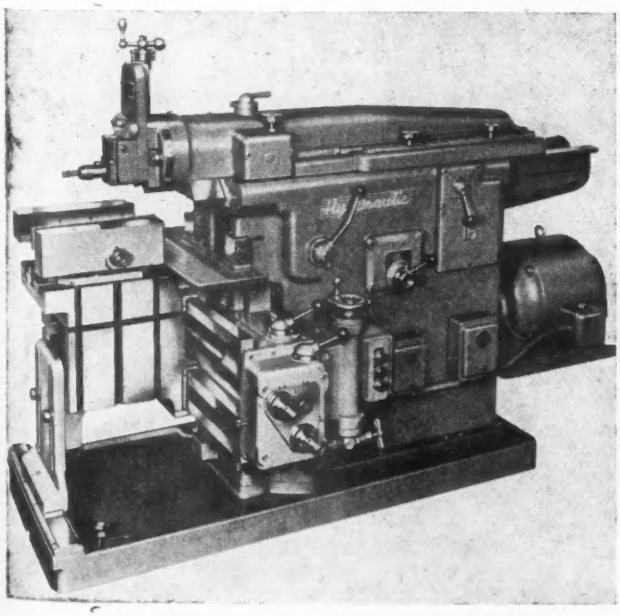
head can be set to an exact angle, by using a sine bar, and locked in place.

The machine can be equipped for moving the grinding wheel carriage by power, an arrangement which is particularly useful when grinding internal or external cylindrical or conical work. It combines the advantages of a simple air prime mover with the accurate control of hydraulics. The air is passed through a filter, lubricator, and pressure regulator to a manual-control valve. The operator may start or stop the grinding wheel carriage reciprocation at any time to suit the job being ground. When the air is shut off, the system is open to atmosphere and allows the grinding wheel carriage to be moved freely by hand. During automatic reciprocation, control of speed is obtained by a simple flat cam or this may be altered with a profile to allow a variable velocity. The hydraulic section is equipped with suitable bleeders and a semi-automatic oil filler unit. The trip dogs control the reversal points. One trip dog may be manually pivoted so as to allow the grinding wheel carriage move to wheel-dressing position.

Also incorporated in this machine is an adjustable grinding wheel trueing device, designed to allow the grinding wheel to be dressed at any time without losing finish-size position on the feed dial. The center of an arc dressed on the grinding wheel will be on a line parallel to the grinding wheel carriage travel and will also intersect the center of oscillation. Thus, with the grinding wheel carriage stops properly set, work requiring combination form and generated grinding may easily be done.

## E-52—Hydraulic Shaper

Rockford Machine Tool Co., Rockford, Ill. Hydraulic ram type shapers. The new Rockford Hy-Draulic ram type shapers are heavier, more rigidly constructed machines of their make than have ever appeared before. Added strength has been provided by increasing the general cross-section sizes of the rail and table construction. The heaviest type cut may be taken without affecting the parallelism between the stroke of the ram and the established horizontal plane of the work surface. The shapers are built in 12, 16, 20, 24 in.; special, 24 in. heavy-duty and 28 in. stroke sizes. Heavy work of any type may be machined with accuracy on any machine running to the full stroke capacity.



*Rockford Hy-Draulic shaper*

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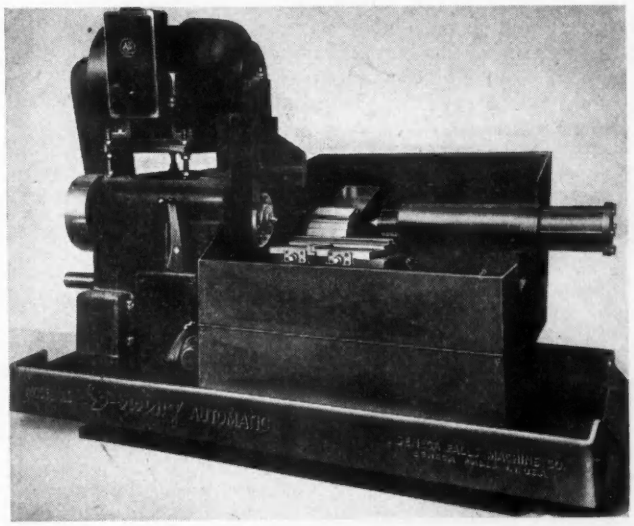

*Model AR Lo-swing automatic lathe.*

## E-53—Automatic Lathe

Seneca Falls Machine Co., Seneca Falls, N. Y. Model AR Lo-Swing automatic lathe. Featured in this machine is an instantaneous tool relief control mechanism which permits reversing the rotation of the feed mechanism at any time during the machine cycle. This control mechanism is said to reduce tool breakage and down-time. In case of necessity, the operator pushes a lever and the carriages and slides return to the starting position without disturbing the timing of the slides or the setting of the tools.

The Seneca Falls simplified change-over mechanism has also been incorported in this machine. All cams may be pre-set to graduated dials for the desired length of cut, eliminating loss of time with the old method, and eliminating necessity for changing cams. Another feature includes a new type front carriage, designed to facilitate loading and unloading of the part.

## E-54—Semi-Automatic Threading Machine

Landis Machine Co., Waynesboro, Pa. A four-spindle, semi-automatic threading machine for threading automotive parts, bolts, studs, axles and rods on a high production basis. The machine has a range of ¼ to one in. diameter threads, with manual labor being confined to loading and unloading the grips that are automatically opened and closed. The forward motion of the spindles and sliding housing to which the die heads are applied is controlled by a compound system of springs. The starting spring is readily adjustable for both amount and duration of tension, thereby preventing side shaving of the first thread, eliminating taper and aiding in the production of threads having an accurate lead. A cam mechanism re-

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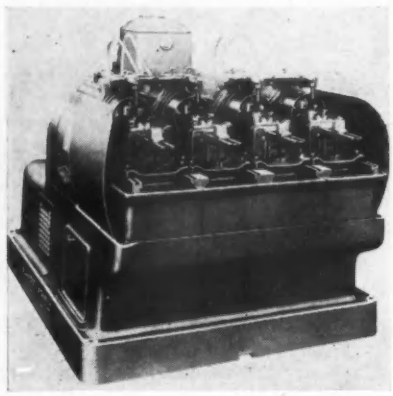
turns the spindle and sliding housing to the starting position and controls the opening and closing action of the grip jaws. The machine is operated at a low threading speed which greatly increases the life of the chaser.

This semi-automatic threading machine is equipped with pull-off type Lanra die heads. The die heads employ the Landis tangential type chaser



***Landis four-spindle semi-automatic threading machine.***

which features interchangeability, simple grinding operation, and free cutting action which is said to assure long tool life and accurate, smooth finished threads. Average production rate of the machine is stated by the manufacturer to range from 500 to 2000 pieces per hour, depending on diameter and thread length.

### E-55—Crankshaft Turning Machines

Wickes Brothers, Saginaw, Mich. Crankpin turning machines. These machines are designed for turning crankpins on large, Diesel-type crankshafts. They are equally suited to turning intermediate main line bearings, and end bearings if there is sufficient stub on crankshaft ends for support.

Wickes crankpin turning machines will completely cheek, turn and fillet crankpins or bearings from rough forgings to finish sizes with an accuracy of .001 in. Polishing blocks can be used for a final smooth finish with no machine down-time for set-up.

The crankshaft is easily set up for machining on this unit because it is supported on the main-bearing journals on stanchions close to the cutting tool. Unlike the conventional arrangement, the crankpin can be completely finished and polished in the lathe without change of set-up.

The crankpin turning machine is designed for higher cutting speeds and heavier cuts, which means that the metal can be removed faster. Also the use of two separately mounted cutting tools increases efficiency.

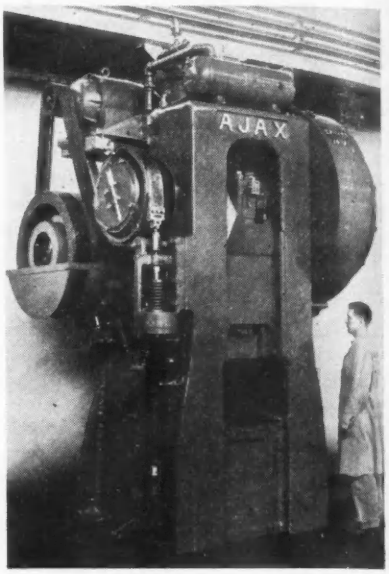
The crankshaft is rigidly supported on heavy stanchions and, since the tool rotates around the shaft, the pin does not vibrate and deflect. This results in freedom from machining chatter. To accommodate various sizes of main bearings, accurate spacer blocks are provided so that the center line of the bearing is always central to the ring assembly.

Wickes crankpin turning machines have their most important use when crankshafts to be machined are extremely large making it impractical to machine them in higher production universal-type crankshaft lathes, or when grinding equipment is not available for finishing operations.

Depending upon production requirements, these machines are also recommended by the manufacturer for final finish only—rough turning being done on higher production universal-type lathes.

### E-56—High Speed Forging Press

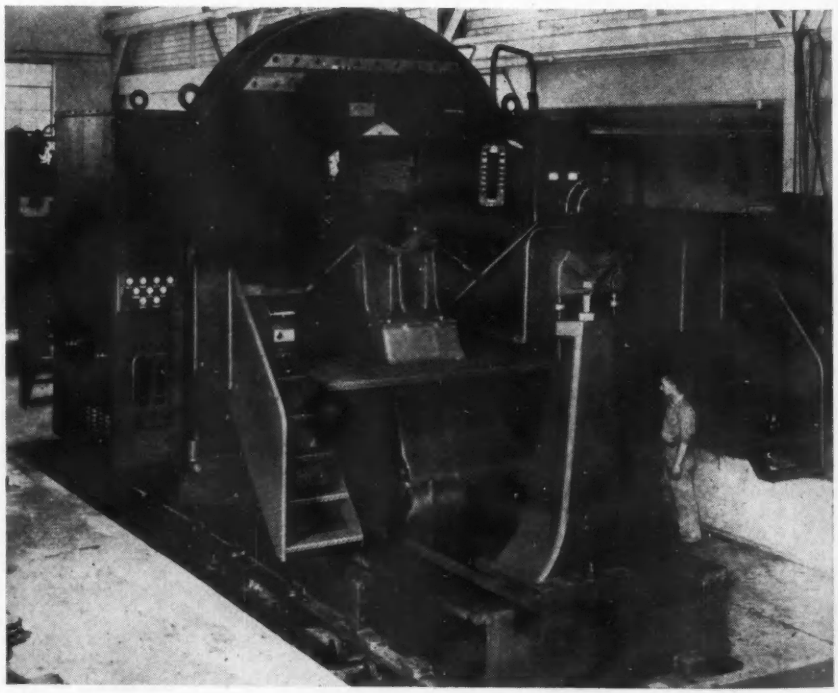
The Ajax Manufacturing Co., Cleveland 17, Ohio. A 5C high speed vertical forging press. The 5C forging press is specially constructed for high speed production if impression die forgings from steel, aluminum, magnesium, copper, brass, and stainless alloys. This press is also employed for hot and cold coining stampings and forgings. It is an improved design with the air clutch mounted directly on the main eccentric




***Ajax 5C high speed, solid frame forging press***

shaft which permits higher operating speeds, quicker sequence of blows, and consequently higher production than the Ajax standard speed presses with air clutch on the back shaft introduced into forge shops in the early thirties. Ajax forging presses are numbered according to the approximate tonnage developed at the end of the stroke; thus the 5C develops 500 tons.

Dies for these presses can be built up of comparatively small die elements or inserts of hard, high grade steels. Coupled with this, the brief period of



***Wickes machine for turning crankpins on large crankshafts***

contact with the not metal and the practice of usually striking only one blow in an impression, results in low die costs. Die inserts are usually held by a simple clamping arrangement in shoes or bolsters with guide pins to facilitate alignment.

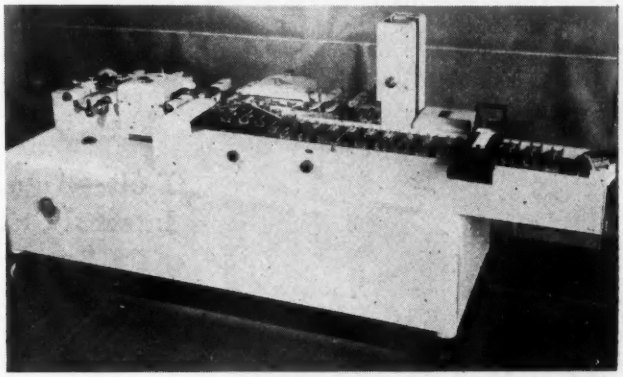
The 5C press takes up seven ft by two in. floor space. It extends approximately 12 ft above the floor with no part below floor. The motor is 25 hp.

## E-57—Automatic Packaging Machines

A. H. Ross Co., Inc., Ludlow, Ky. Fully automatic packaging machines that will load a wide variety of different-sized products into cartons while optionally tuck-sealing or gluing the cartons. Virtually anything that can be packaged by hand can be handled by the machine. It has particular application in cartoning spark plugs and other replacement parts. Cartoning speeds range anywhere between 60 and 280 packages per min, depending upon the commodity. The machine may be converted from one size cartoning to another by adjusting dial controlled units that are permanently attached to the machine bed. All adjustments are made by using factory furnished charts which provide the numbered dial settings required to package any sized product within the machines capacity.

Three sizes of these machines are currently in production. The Ross Model A cartoning machine nandles cartons having a minimum length of 2¼ in. when folded, or a maximum overall length of 10 in. in the original, or flat, state. The Model B packaging machine accommodates products which can be fitted into cartons of 4 in. minimum folded length and 14 in. maximum overall flat length. Other cartons, measuring not less than 6 in. folded nor more than 18 in. flat, are used to package products on the Model C machine.

When products are automatically carried into a Ross machine, each unit is equidistantly spaced on a feeder belt by means of a timing star wheel. It is then picked up by a carrier pocket that is attached to an endless drive chain. Parallel to the product feeder line is a similar line carrying the erected cartons which will ultimately house each unit. Prior to the erecting, these cartons were loaded flat into a vertical magazine, were picked from the magazine by means of accurate dimension-ground fingers which erected and placed them in the line parallel with the products. Toward the end of the two lines, the product feeder line and the carton sealing line, a cam bar is placed at an angle which forces the product into the carton.



***Ross automatic packaging machine***

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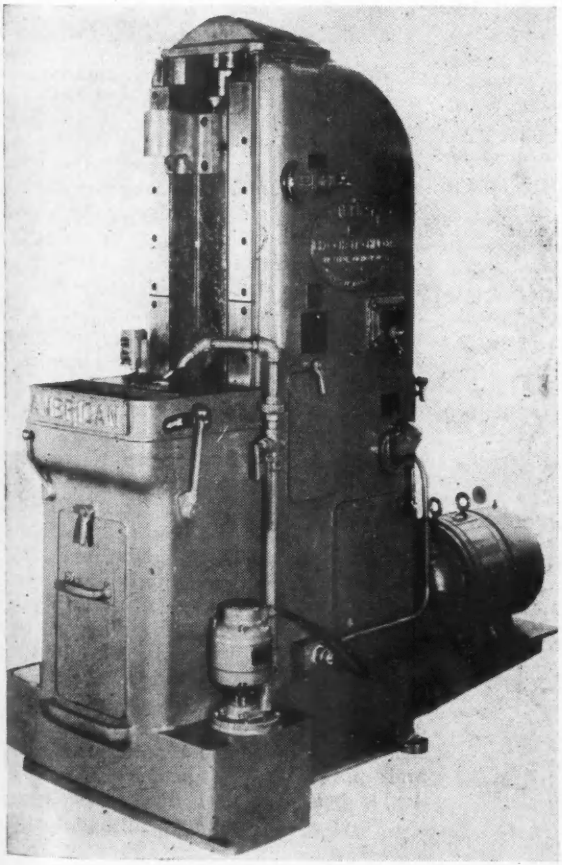

## E-58—Improved Broaching Machine

***American Broach and Machine Co., Ann Arbor, Mich. Type T three-way vertical hydraulic broaching machine. An improvement has been made in the coolant assembly of this machine while minor changes have been made in the design of the work table. Coolant is supplied from an enlarged reservoir located in the work table base, and by an integral motor and centrifugal pump unit located on the side of the machine below the operating lever. Mounting is such that the pumping unit can be taken out by removing four screws and disconnecting inlet and discharge pipes. Sizes range from four to eight tons with 24-in. stroke and six to 15 tons with 36-in. stroke.***

## E-59—Automatic Turret Lathe

Potter and Johnston Machine Co., Pawtucket, R. I. Automatic turret lathe, 3-U Speed-Flex. This small-size turret lathe has been developed for machining castings and forgings up to six or eight in. in diameter by approximately four in. long. It weighs 5000 lb, as compared to 8000 lb for the smallest machine of its type previously built by the company. The new machine is regularly furnished with spindle speeds ranging from 73 to 1445 rpm, but dual speed ranges of 36 to 711 rpm and 73 to 1445 rpm can be provided if desired.

This lathe has a swing over the cross-slide of 8¾ in., and is equipped with a chuck eight in. in diameter. The cross-slide has a travel of 2½ in. each way, and the turret-slide has a travel range of six in. Turret-slide and cross-slide feeds range from 0.0023 to 0.0684 in. or from 0.0042 to 0.125 in. per spindle revolution.

Adjustment of the spindle in the headstock provides for a variation of the minimum distance between the spindle nose and the various turret faces. Four automatic changes of spindle speed are obtainable with each set of hand pick-off gears, and three automatic changes of feed can be similarly

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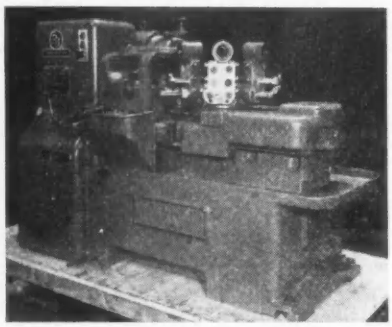
secured. Multiple disk clutches are employed for the speed and feed changes, electro-pneumatic control being provided for these changes, as well as for rapid traverse. The change from rapid traverse to reverse feed, or vice versa, is accomplished in one-fifth second.

The cross-slides of the machine act either independently or simultaneously in conjunction with selected turret



***Potter and Johnston Speed-Flex automatic turret lathe.***

faces, and may operate with all six turret faces. The turret-side is of rigid construction, and the turret is automatically clamped in position after indexing, the indexing operation being performed by a Geneva motion mechanism. Accurate alignment of the turret with the spindle is accomplished by a combination locking and binding wedge.

The turret-slide is actuated by a face cam, and is provided with a cam-actuated plunger for the operation of vertical and horizontal slide tools applied to the turret faces. Idle movement time for the turret-slide and cross-slides for a complete cycle of the machine is said to be only 24 seconds. A motor-driven coolant pump and piping system, as well as provision for conveying cutting lubricant through the turret, are available.

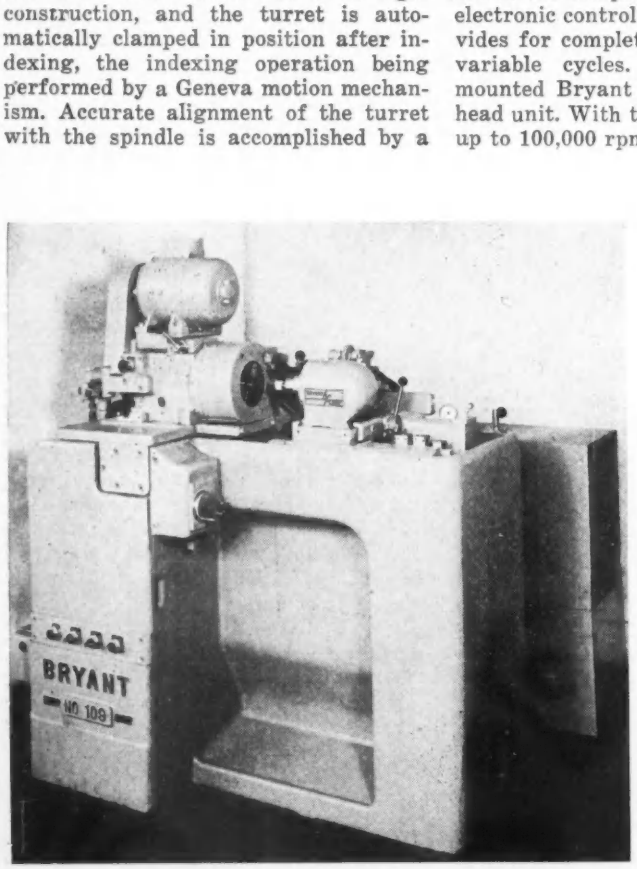
Provision has been made for an overhead piloting arrangement when specified, and taper boring and turning attachments are available. Special tool equipment, such as collapsing taps, self-opening die-heads, multi-spindle drill heads, micrometer turning stems and boring-bars, tool for size-turning behind a flange in opposite direction to that of turret-slide travel, and overhead cut-off tools, is available.

### E-60—Automatic Internal Grinder

The Bryant Chucking Grinder Co., Springfield, Vt. The No. 109 automatic internal grinder, particularly designed for the high production grinding of bore diameters from ¼ in. to three in., up to four in. deep. The new grinder will swing work up to nine in. and is suitable for such jobs as ball bearing races, gears, rolls, bushings and other small parts which can be produced most profitably in large quantities.

The most important feature of the 109 is the comprehensive hydraulic and electronic control arrangement that provides for completely selective, infinitely variable cycles. It uses the direct-mounted Bryant high-frequency wheelhead unit. With this drive, wheel speeds up to 100,000 rpm can be attained. Provision has also been made for a balanced, belt-driven wheelhead, giving speeds from 200 to 2400 rpm. By providing d-c motors (built-in rectifiers allow the use of standard a-c power) to supply driving power to the cross feed and the work drive spindle, an infinite number of feeds and speeds are available.

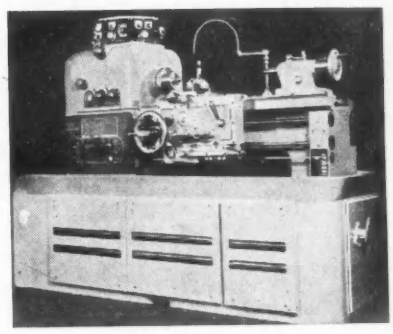
The machine is designed so that the full grinding cycle proceeds automatically and operator attention is required only for loading and unloading the work and tripping the valve to start the cycle. The machine then operates automatically through the following cycle—rough grind, true wheel, finish grind and return to chucking position as finish size is reached.




***Bryant automatic internal grinder No. 109***

### E-61—Precision Toolroom Lathe

Rivett Lathe & Grinder Inc., Boston, Mass. A precision cabinet lathe capable of turning work up to 10 in. diam and 20 in. long. This lathe has 72 selective feeds or thread cutting



***Rivett 1020R precision toolroom lathe***

capacity through a dial controlled gear box, and spindle speeds from 24 to 2700 rpm. The electronically controlled drive is through a Dynamite coupling, directly coupled to a two-hp, 1800 rpm motor. The unit provides a variable speed with dynamic braking. All electrical controls are turret mounted on top of the headstock at a finger-tip, eye-level location to operator. A hydraulically-operated carriage reversal clutch reverses carriage without stopping or reversing lathe spindle. The lathe bed has separate vee and flat ways for carriage saddle and tailstock.

All assemblies such as the headstock, gear box, carriage and drive are self-contained and can be individually removed from the lathe for service and repair. Headstock and gear box power gears have 20 deg pressure angle and are shaved and heat treated; these gears mount on involute splined shafts all running on anti-friction bearings. All carriage gears including the rack and pinion have adequately spaced double ball bearings. Headstock, gear box and carriage are automatically lubricated.

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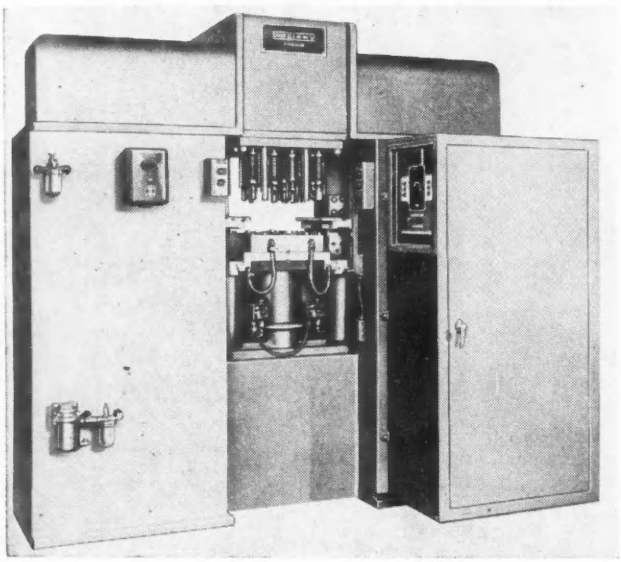
### E-62—Multiple Welder

Sciaky Bros., Inc., 4915 W. 67 St., Chicago, Ill., Multiple welder type MGMS2-8 for hot upsetting, spotwelding and projection welding of intricate small parts to a steel panel in one operation. The welder is an open-throated assembly of individually - controlled welding guns. Transformers and control equipment are compactly mounted on either side.

The parts to be welded are placed in a locating jig by one operator while another operator places another loaded jig over the retractable lower platen.



*Sciaky Type MGMS2-8 multiple welder*

Releasing jig drops all parts into lower dies. Meanwhile, operation on other side of machine is placing panel in position. An air cylinder then moves the platen up until a special contact is made with conductor from transformer, and upper electrodes, which are shaped to fit the parts, are in welding position. The upper electrodes can be positioned at will to accommodate other type of panels.

The manufacturer states that the welding regime can be set to any sequence desired by means of telephone jack type control board. Operation on a perfectly balanced load on all three phases of the supply line is achieved by use of the Sciaky "Three-Phase" system.

### E-63—Automatic Sizing Unit

The Monarch Machine Tool Co., Sidney, Ohio. A new automatic sizing unit for converting a standard engine or toolmaker's lathe from manual to automatic operation for such work as step shaft turning, boring, facing, and contour turning, or any combination of them.

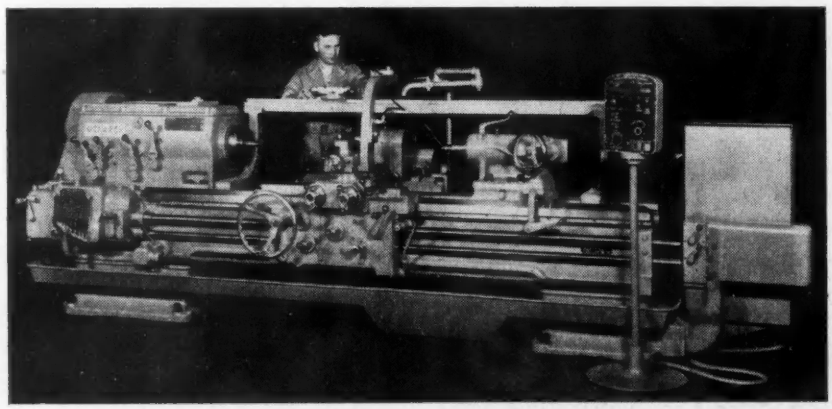
Conversion from manual to automatic operation, the manufacturer states, takes about one min, with a set-up time of from five to fifteen min, thus making it economical to use the automatic sizing equipment for small quantities of parts. It is also said that, in tests which have been made with the new equipment, production has been increased by two to one. The quick set-up time with maximum production cycle makes it, for most applications, equally as fast as an automatic lathe.

On shoulders the tool rapid traverses out (100 in. per min) to a stop to within any predetermined distance from the OD of the next diameter. Feed for this diameter starts automatically at the predetermined feed rate. A minimum of time is required for the tool to move out into position for the next largest diameter. The machine will respond to a diameter change of as little as 0.001 in. At the end of the cut the tool backs away from the work, immediately following which the carriage rapid traverses back to its starting position at the rate of 100 in. per min.

Size control is by means of diameter gage blocks, micrometer gage blocks or a template. They are mounted on a rail to the rear of and above the work center line. Consequently, all set-ups may be made by the operator from the front of the machine. Diameter gage blocks are ordinarily preferred for work which will be repeated from time to time. Otherwise the micrometer gage blocks are recommended for most step shaft jobs. A template is employed by some users for step shaft work which is frequently repeated. If tapers or contours are to be formed, a template is required.

The automatic sizing controls are mounted on the right hand end of the machine. Separate feed motors supply power for the length feed and the cross feed. Both of these motors are electronically controlled with the result that there is constant feed regardless of load variations. Both the length feed and the cross feed range from ½ to 20 in. per min.

A control stand may be located at any desired point convenient to the operator at the front of the machine. From this point he selects the ideal length feed and cross feed during set-up, and starts and stops the automatic sizing cycle. From the front of the carriage he may index the rear vertical turret, bringing the desired cutting tool into operative position. The turning tool, mounted in the front tool slide, is so positioned that after return of the carriage at the end of each length cut, the tools mounted in the rear vertical turret are in the proper position for doing their work. Automatic sizing is available on all Monarch 14-in. engine and toolmaker's lathes and larger.



*Monarch lathe equipped with new automatic sizing unit*

### E-64—Automatic Double-End Driller

Buhr Machine Tool Co., 837 Green Street, Ann Arbor, Mich. An automatic double-end driller, the "Buhrmatic," for production drilling of crossed holes.

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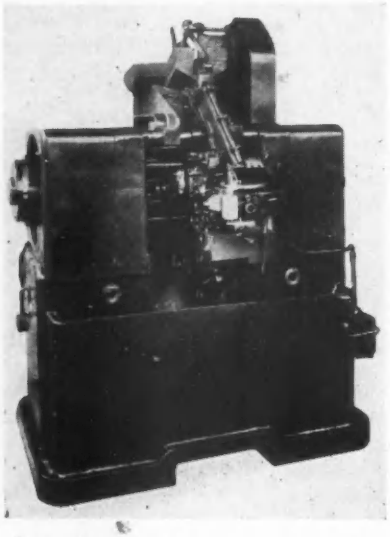
*For additional information regarding any of these items, please use coupon on page 120*

The machine is hopper fed. It drills, reams, countersinks and checks at desired angles by indexing the collets in an indexing turret, providing eight work stations and a loading and unloading station. The Buhrmatic can be operated in batteries of four by one operator; parts are loaded in one hanradially arranged about the axis of the spindle carrier, making possible the same line of forming thrust for every position, minimizing overhang and allowing interchangeability of holders among the five, heavy-duty forming positions.

No cam changes are required for a change in stock feed length. A universal tool slide cam eliminates cam changes for the main tool slide. By adjusting a calibrated dial, any ratio of feed to approach may be obtained without changing the high point or drawback point. Therefore, tool holders need not be repositioned. Cross slide cams are interchangeable among five forming positions and are contained within the cross slide mounting. Three screws and a cover plate are removed and the cams are ready to drop off. A supply of ten cams covers the majority of jobs. Also, a change in set-up does not require a change in stops, high points, drawback points, total stroke, or a sacrifice of working time on either cross slides or main tool slide.

Other features include: a program wheel on the front of the power case which indicates the high point and drawback of all cross slides and main tool slide, and the high and low speed cycle of the machine; manual unchucking in any position; cut out of the feeding mechanism when desired; and hardened and ground slides.

These machines are designed to use carbide cutting tools, and are available in 1¼ and 2¼-in. sizes.



***The Buhrmatic, an automatic double-end driller for production drilling of crossed holes***

dling, and ejected automatically. Safety devices are incorporated to stop the machine in order to prevent damage from broken tools or other impediment to the process. The original machine, developed to drill, ream and countersink two lacing holes in a 5/16-in. bolt, is said to have produced at the rate of 960 pieces per hour at 80 per cent efficiency. New developments show the Buhrmatic to be adaptable for processing other parts within the chucking capacity of the machine such as bushings, bearings or pins, which are required in great volume.

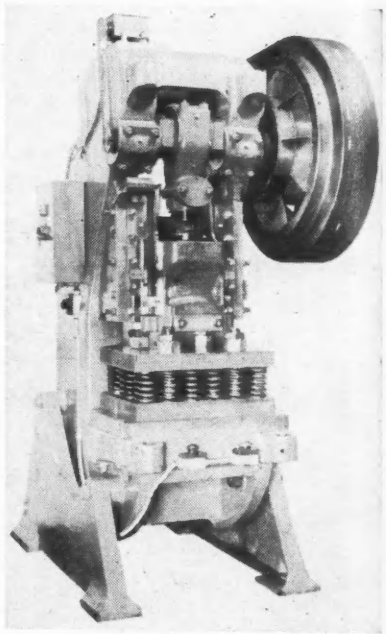
## E-65—Automatic Screw Machines

New Britain-Gridley Machine Div., the New Britain Machine Co., New Britain, Conn. A line of multiple-spindle automatic screw machines. These new screw machines incorporate improvements in set-up and change-over, carbide tooling, interchangeability of tools and automaticity. Six independently cammed cross slides are

## E-66—Inclinable Punch Press

The Cleveland Punch & Shear Works Co., Cleveland 14, Ohio. An inclinable press equipped with an entirely new drum type air friction clutch and brake. Due to the lightness in weight of the clutch, quicker starting and stopping is assured and there is a considerable saving in the horsepower required to operate the clutch. When the air is applied to the cylinders, which are designed to provide maximum performance with the use of a minimum amount of air, the clutch engages the flywheel and when the air is released the brake takes effect on the main shaft. In the event of failure in the electric current or air supply, the brake is designed to bring the machine to an immediate stop.

The clutch is self-adjusting and is so arranged that it can readily be serviced, when necessary, without removal from the press. Furthermore, as all friction surfaces are on the same cir-

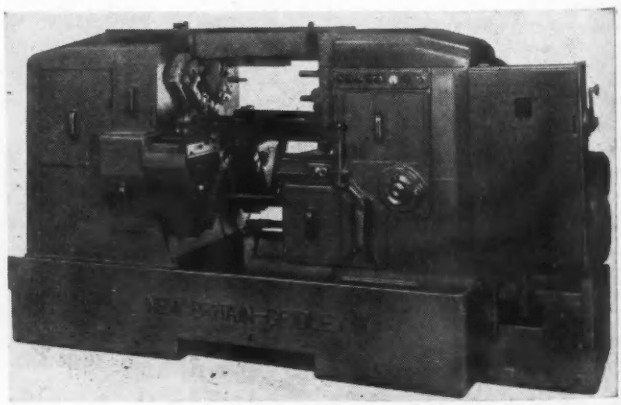


***Cleveland 9-I inclinable press equipped with new drum-type friction clutch and brake***

cumference there is no differential friction, consequently, wear is minimized in proportion to the weight of the clutch and as there is complete disengagement of all idle friction surfaces, drag, unnecessary wear and heat are eliminated.

The clutch and brake is a combined unit of one-piece construction and cannot, therefore, become separated while the press is in operation, thus the possibility of both the clutch and brake becoming engaged simultaneously is entirely eliminated. As an additional safety feature, the clutch can be set to slip under an overload.

The clutch and brake can readily be applied to any size, new or old press, either flywheel or back geared, and, in every case, is mounted directly on the drive shaft.



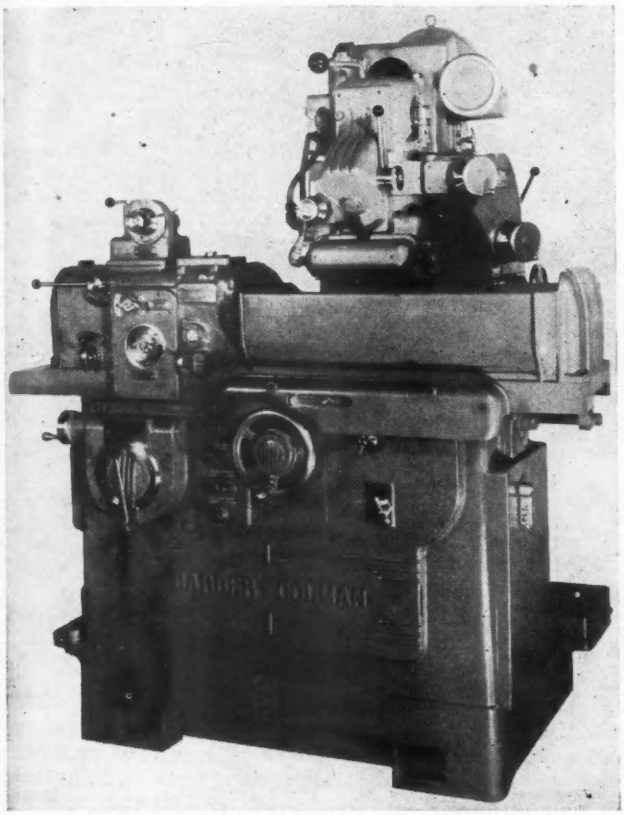
***New Britain-Gridley model 601 1¼-in. multiple-spindle automatic screw machine***

## E-67—Automatic Hob Sharpening Machine

Barber-Colman Co., Rockford, Ill. No. 6-5 automatic adustable stroke hob-sharpening machine for sharpening high-speed steel or carbide-tipped hobs and form cutters. This machine is designed with facilities for accommodating a wide variety of sizes and types of work. It handles six-in. diameters and five-in. lengths, and a minimum lead of 8.5471 in., with a 40 deg sine bar setting. The increments of feed (at three-in. diameter) range from 0.00015 in. to 0.0009 in., in 0.00015-in. steps. Stock removal, based on three-in. diameter, varies from zero to 0.0125 in. Index plates furnished with the machine include 10, 12, 14 and 16 divisions, although plates are available to handle any number of gashes from three through 33. Adjustable spindle speeds includes 3600, 4300 and 5000 rpm. Adjustable hydraulic table permits approximately five to 20 cycles per min, while the length of stroke can be adjusted approximately from three in. through eight in.

The No. 6-5 Barber-Colman is said to hold adjacent spacing within 0.0001 in., and non-adjacent spacing as close as 0.001 in. For helical gash angular setting, there is a vernier on the sine bar mounting plate and one minute graduations on the hand adjustment dial which permit accurate lead settings. Precise positive or negative rake settings permit alignment on straight gashed work within very close units. Rake errors on helical gash work can be held to 0.001 in. on many classes of work. Dual torsional expanding spring tension removes all backlash between the sine bar and wheel spindle. The wet grinding feature, coupled with the wheel spindle rigidity, produces a micro-inch finish of from 10 to 20, depending on the wheel, coolant and table speed.

This hob sharpening machine also features interchangeability of grinding wheels for high-speed or carbide-tipped hobs, precise indexing with table cycle interlock, adjustable grinding wheel speeds, sensitive wheel quill feed for dressing to precision alignment, circumferential mechanical and manual feed in continuous direction (re-setting not required), automatic index counting, feed disconnect, spring loaded quill in tail center, built-in dresser for gash angles up to 8 deg, diamond setting gage, positive interlock to insure completion of index movement before starting of table cycle, and combination foundation pockets, with hold-down bolts, leveling screws and crane sling hooks.



*Barbar-Colman No. 6-5 automatic hob sharpening machine*

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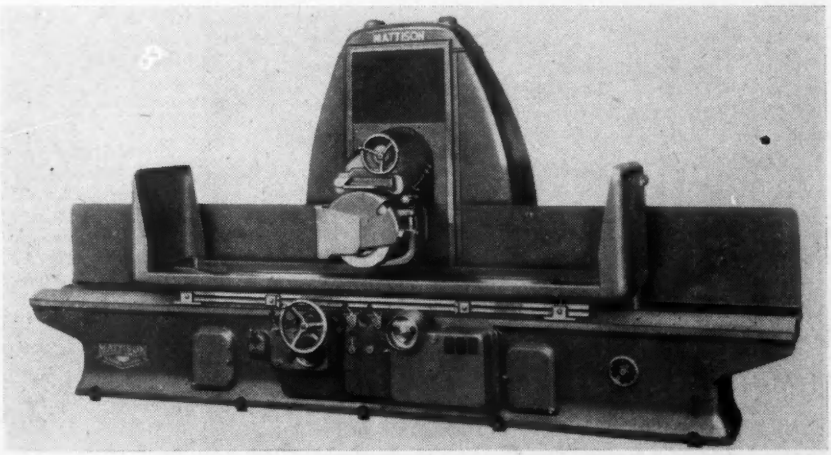
## E-68—Precision Surface Grinder

Mattison Machine Works, Rockford, Ill. High-powered precision surface grinder with hydraulic feed. This machine can handle regular flat work and large size castings weighing up to five tons. V-type and flat ways, as well as contour work, can be ground by a wheel that has been dressed to an angle or radius. Shoulder and edge work can be easily ground because of wheel clearance and spindle construction. In many cases multiple punching dies can be resurfaced without removing leader pins. Interrupted surfaces are held to close limits of accuracy due to rigid spindle mounting. Bronze, lead and various types of metal can also be ground.

A special feature of this machine is the massive double-column support for the wheel-slide assembly. Wide bearing surfaces on the face of the columns and dovetail bearing surfaces on the back provide an eight-point support of great stability. The wheel-spindle, with its enclosed built-in motor, is mounted in a heavy housing. The table has a non-differential, twin-cylinder hydraulic drive, providing equal speed in each direction, with cushioned reversal and longitudinal travel of the table. The




***Mattison 24 by 96 in. high-powered surface grinder with hydraulic feed.***

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transverse feed of the wheel is also hydraulically operated, all operating and adjusting controls being at the front of the machine.

The grinding spindle lubricating system is independent of the rest of the machine, having its own pump, motor and oil reservoir built into the rear end of housing of wheel slide. A pressure control switch provides the interlock to prevent operation of spindle without adequate lubricant pressure.

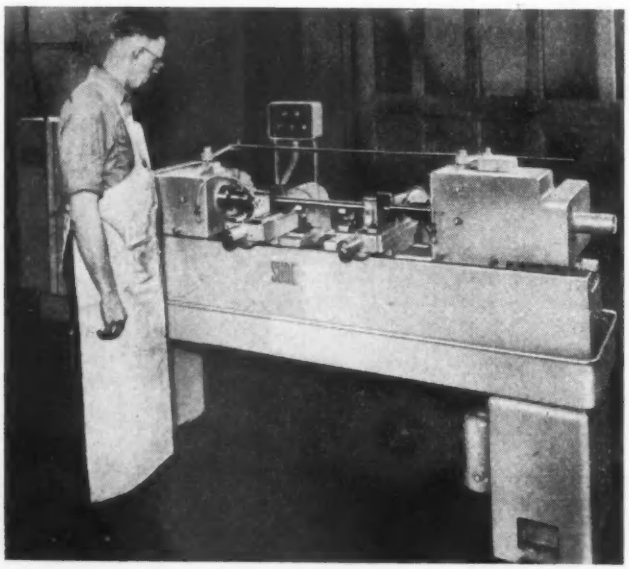
The front spindle bearing is a heavy-duty, adjustable, bronze, sleeve bearing which is oil lubricated from the pressure lubrication system. The preloaded precision ball bearings on the rear of spindle operate in a continuously circulating bath of oil, also supplied by pressure system.

The Mattison surface grinders are built with table sizes ranging from 12 to 36 in. wide by 36 to 192 in. long. Wheel head adjusts vertically between table surface and wheel to allow from 16 to 24 in. depending upon the size machine. Larger table sizes and additional wheel head capacity can be provided.

## E-69—Drilling and Centering Machine

Sundstrand Machine Tool Co., Rockford, Ill. Power feed, double-end drilling and centering machine. Objective in the design of this centering machine was to provide both power feed and power clamping in order to simplify operator's duties and provide complete mechanical control to the centering operation. Among the other features are: individual motor drive to each head so that the spindle can run at different speeds when different sizes of center drills are required; quick change of spindle speeds; easy feed rate changes; and fast setting for different sizes of parts.

Vise jaws are of the inter-locking, self-centering type, and they hold work ranging from one-half to four in. with one set of jaws. Each vise has a separate motor which rotates a screw which in turn opens and closes the vise jaw slides. Vise operation is controlled from the push button station centrally located on the machine bed. There are four possible speed changes for each head.

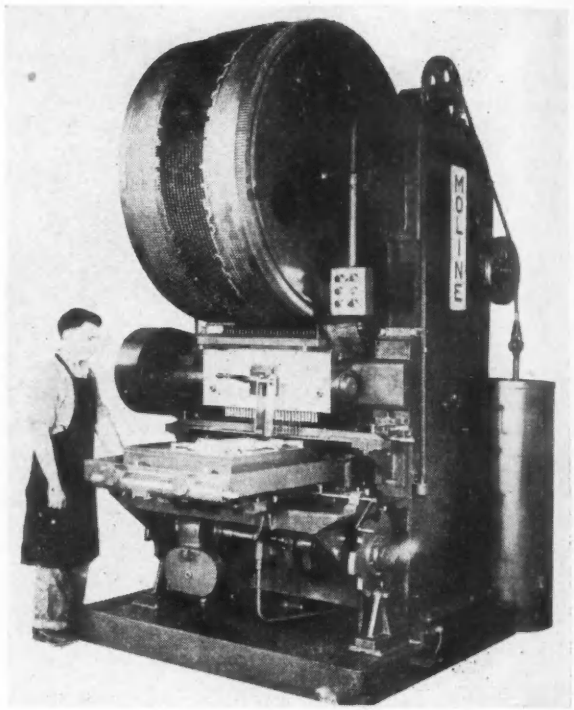


*Sundstrand double end drilling and centering machine with power feed and power clamping*

## E-70—Automatic Drilling Machine

Moline Tool Co., Moline, Ill. The Moline CF140 special 29-spindle machine for automatic drilling of aluminum header plates. This machine was designed and built for drilling all of the holes in aluminum header plates used in head transfer equipment for aircraft.

Some of the plates to be drilled are of a shape which approaches an ellipse, whereon the major axis of the drilled area is about 25¼ in. and the minor axis is approximately 13¾ in. In this area approximately 3700 holes of slightly less than ¼ in. diam are drilled in rows where the center to center distance from one hole to the next is ¼ in. The rows of holes are spaced slightly less than ¼ in. from the center line of one row to the center lines of adjacent rows; and the holes are staggered from one row to the next. Also, there are wider row spacings at intervals to allow room for the insertion of baffles. The plates are stacked in pairs and one pair is drilled during a complete operating cycle of the machine.




*Moline CF140 special 29-spindle machine for automatic drilling of aluminum header plates.*

The machine is equipped with a method for automatic spindle selection, which is synchronized with the indexing of the work table. The spacing of the spindles is such that every third hole in a row is drilled at one pass of the drills. Thus the table must index sideways twice to complete the drilling of each row of holes. The spindle selector drum has no motion either vertically or horizontally, but is indexed so that it turns on its horizontal axis at each pass of the drills. Each indexing motion brings a new row of holes in the spindle selector drum into position directly above the drill spindles. The work table on which the pair of plates to be drilled is mounted is moved up and down

by cam action to produce rapid traverse and feed.

On the same slide with the table is mounted the rail which carries the drill spindles. Thus, when the table moves upward, the drills also move upward at the same rate. At the point where feed begins and the upper ends of the spindles reach the drum, the upward motion will end for any spindle which contacts a plug that has been inserted in the hole in the drum which happens to be directly above that particular spindle. Consequently, as the table continues to feed the work upward the selected spindles will drill holes. After any one row of holes is completed, the work table moves at right angles to the rows of holes in order to locate the work in readiness for drilling the holes in the next row.

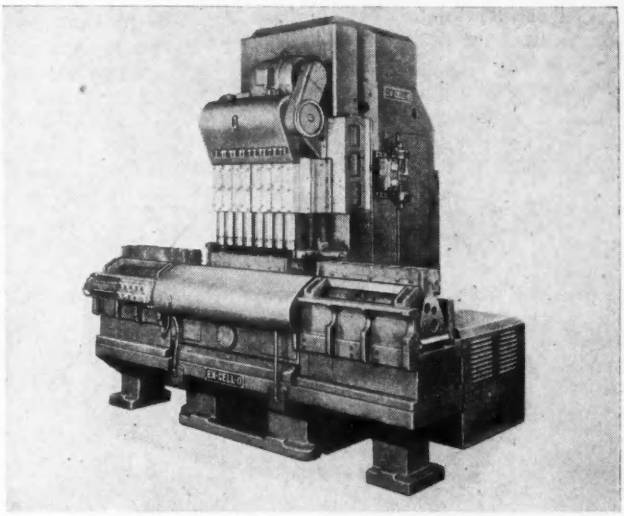
This routine is continued with the spindles being selected and the indexing of the work both sidewise and from row to row of holes until all required holes have been drilled. Then the machine stops automatically.

## E-71—Precision Cylinder Boring Machine

Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 6, Mich. Vertical precision cylinder boring machine. The manufacturer states that this machine is especially suitable for high-production boring of automotive engine blocks, but that it can be used equally well for boring holes in any part where accuracy of roundness and straightness is required. When the machine is equipped for multiple boring operations, the spindles are driven through worm and worm gears. With special spindle equipment, provisions may be included to prevent tool drag back lines on the return stroke.

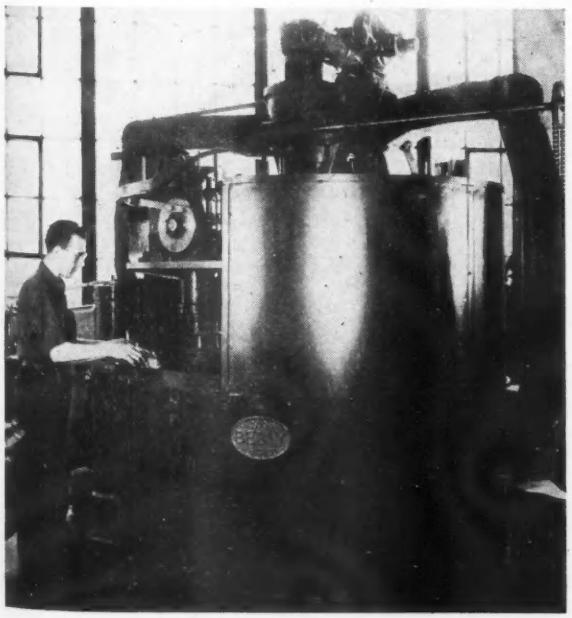
The spindle slide is hydraulically operated, and can be controlled either electrically or manually. Two adjustable rates of forward feed and a fixed rate of rapid approach and return are available. The whole machine is arranged so that parts are readily accessible for service. The hydraulic control panel is flange-mounted to the side of the machine column, and can be removed without disturbing any hydraulic lines. The electric panel is mounted at the rear of the column at a suitable height for trouble-free operation and convenient inspection. The hydraulic pressure fluid for operating the spindle slide is supplied by an independent motor, pump and sump unit. This unit is placed adjacent to the machine where it is easily accessible for service.

The counterweight fastening can be moved to the center of weight of the spindle slide after the spindles and drive assemblies are mounted. The spindle slide is supported on hardened and ground ways with large wear areas. The ways are arranged for minimum variation of operating clearance due to temperature changes. They are also arranged for most convenient fitting, and are lubricated from an independent power-operated lubricating system.



*Ex-Cell-O Style 66 vertical precision cylinder boring machine.*

## E-72—Wet Grinder with Rotary Feed



***Charles H. Besly and Co., 118-124 N. Clinton St., Chicago 6, Ill. No. 372 Vertical spindle 53-in. wet grinder with rotary feed. This machine is tooled to grind cast-iron gear covers. It contains a revolving fixture with revolving work holders. The fixture runs at one revolution every 70 sec, and the spindle speed of the grinder is 357 rpm 6,711 sfm). The stock removed is approximately 1/32 in., or enough to clean up the casting. Production rate of this machine, it is stated, is approximately 240 pieces per hr. When smaller size castings are ground, two or more can be clamped into each work holder.***

## E-73—Universal Grinding Machine

Cincinnati Grinders, Inc., Marburg Ave., Cincinnati 9, Ohio. The Filmatic 10-in. hydraulic universal grinding machine, available as a precision tool-room grinder or a precision production grinder with universal features. The machine is built in 24-in. length only.

A hinged internal grinding unit at the front of the wheel head remains in place during conventional traverse or infeed grinding operations. With the standard quill and wheel, recommended internal grinding capacity ranges from ⅞ in. to 1½ in. diameter by 2½ in. deep. Other quills are available for holes ranging up to three in. deep; and extra wheels range from ¼ in. to 1¼ in. diameter.

The headstock is driven by a ½-hp, d-c motor mounted on top of the unit. A flat belt transmits the power from the motor directly to a pulley mounted on the spindle near its front end. Speed changes are effected through an electronic control unit, built into the headstock, which converts a-c into d-c, by rotation of a small plastic control knob on the headstock. Individual speeds are indicated in a small window next to the

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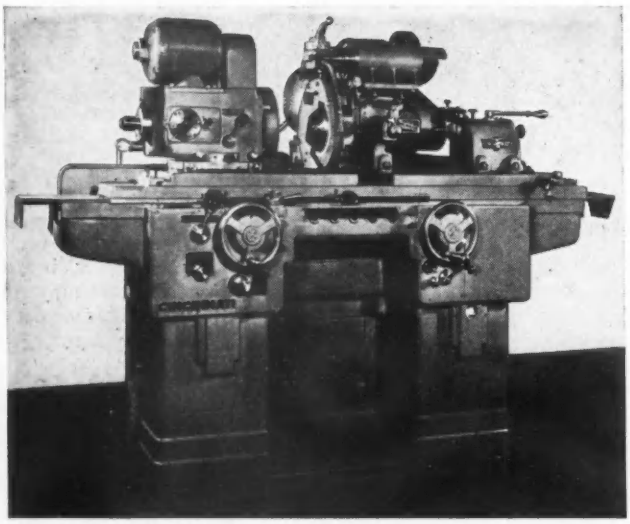
speed change knob. Live or dead spindle work drive may be selected through a lever control at the front of the headstock. This lever is pinned to a threaded stud which operates a self-centering brake on the spindle. A jog bottom, incorporated in the headstock electrical circuit, permits the operator to stop the face plate or chuck in the most advantageous angular position for loading and unloading the work.

Manual table traverse is through a two-speed mechanical arrangement, at the rate of one in. and 1/10 in. per revolution of the handwheel. Power table traverse is hydraulically actuated, infinitely variable from three in. to 280 in. per min, and controlled with a selector knob below the handwheel. Tarry at reversal may be adjusted from zero to five sec. Table traverse with automatic reversal, may be set for strokes as short as 1/16 in. At any length of stroke, and any rate of traverse, the table consistently trips within an accuracy of 0.001 in., the manufacturer states.

The pick-feed mechanism, located in the cross-feed unit, is built in. Rate of pick feed, indicated by a dial, may be selected instantaneously through a knob control. An internally mounted trip out dog stops the pick feed action approximately 0.001 in. before the cross feed micrometer dial reaches its zero graduation. Final sizing is then accomplished by rotating the handwheel to a positive stop, which is engaged and disengaged as desired by moving a small lever. The pick feed cycle is then repeated by pushing a starting knob. Sizing adjustments are in increments of 0.0001 in. diameter reduction.

The footstock has lever retraction of its spindle. It features adjustment of the spring for correct pressure of the center against the work, and two sets of three-segment bearings retain alignment. A diamond truing bracket with micrometer adjustment is mounted on the footstock.

Two types of production infeed equipment may be built into the machine: hand hydraulic infeed for machines used primarily for conventional universal grinding operations, but with the added advantage of the hand controlled infeed feature for moderate quantities of work; and automatic infeed, primarily for shops requiring a combination of universal features with production infeed features. In addition to these two built-in features, other attachments are available, among which are quick change adapters for the face plate and chuck, two types of draw-in collet equipment (handwheel or lever operated), double end shaft motor, and radius truing attachments.



***Cincinnati Filmatic hydraulic universal grinding machine.***

## D-74—Dial Type Milling Machines

The Cincinnati Milling Machine Co., Cincinnati 9, Ohio. A new line of knee-and-column type milling machines for heavy milling operations. These machines, known as Dual-Power and High-Power Dial Types, are built in Nos. 5 and 6 sizes. High-Power Dial Types, available in plain, universal and vertical styles, are driven by 25-hp motors. The Dual Power machines are driven by 40- or 50-hp motors, and are built in plain and vertical styles only.

These machines are designed for shops requiring ample power for taking heavy cuts on large work, and where both high-speed steel and sintered carbide cutters are used. Square gibbed bearing ways on the column and top of the knee, a yard wide knee to support the saddle, and rectangular overarm with built-in vibration damper and full length taper gib clamping are features of the construction throughout.

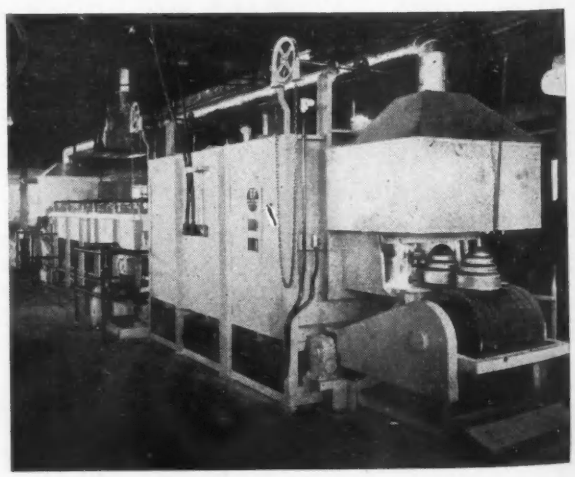
Dual Power machines have two ratings for the horsepower available at the spindle. Those wired for a-c electrical equipment have a 50-hp motor which can deliver its full capacity while the machine is running at any one of 18 spindle speeds from 45 to 1400 rpm. Through automatic controls within the column, 25 hp is delivered at the six low spindle speeds of 14 to 37 rpm.

Twenty-four spindle speeds, 14 to 1400 rpm, and 32 feeds, ¼ in. to 60 in. per min, are available. These speed and feed ranges cover all practical requirements for milling with high speed steel cutters, as well as the sintered carbides. Live rapid traverse is available for the table, cross, and vertical movements, at the rate of 150, 150, and 37½ in. per min, respectively. Speeds and feeds are changed by power, with a single four-position lever having both "increase" and "decrease" positions.

The knee clamp is lever actuated from a control at the front of the machine. To maintain the accuracy of

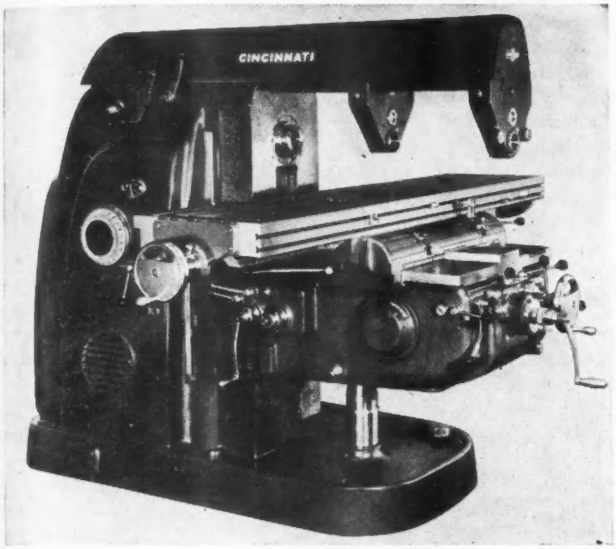
## E-75—Continuous Conveyor Brazing Furnace

***The Electric Furnace Co., Salem, Ohio. Continuous mesh-belt conveyor furnace for brazing and annealing metal assemblies. Aluminum, steel, brass and other ferrous and nonferrous parts are loaded directly on the traveling belt and carried through the heating and cooling zone. This electric furnace can be furnished with conveyor belts of various widths and in several sizes. The traveling belt shown is 24 in. wide and can handle products up to 13 in. in height.***



knee adjustment, a brake is incorporated in the manual vertical control elements. It holds the knee in exact position until readjusted for the next job or the next cut.

The spindle drive clutch is engaged and disengaged hydraulically by a small finger-tip level. The clutch is a dry plate




*Cincinnati milling machine.*

unit rated at about three times the capacity of the machine, and accessible for adjustment outside the column.

Other features include automatic table feed cycles. Various combinations of feed and rapid traverse at the rate of 150 in. per minute, with automatic reverse and return to the starting point, may be obtained through dogs on the front of the table actuating the feed plunger. The hand control lever for this plunger has four directional positions; feed and rapid traverse, right and left.

## E-76—Electrostatic Spray Installations

Harper J. Ransburg Co., Barth and Sanders Streets, Indianapolis 7, Ind. Electrostatic spray installations for high-production painting. Articles to be coated are supported on workholders

*Electrostatic spray painting of automobile body.*

carried on a conveyor and are thus moved in endless procession through a spray booth. In the booth, an electrode of fine wires is arranged on each side of the conveyor. Automatic spray guns are located at the face of the booth to spray the coating material into the booth in a direction roughly parallel to the path of travel of the articles.

Electrostatic deposition is accomplished by charging the fire wire electrode system to a high potential so that an electrostatic field is created between the electrodes and the grounded articles. Then, as the atomized coating material is sprayed into this field, the particles receive a negative charge and are attracted to the opposite polarity — the line of grounded articles.

The attraction in the coating zone is so great that some of the paint particles even reverse their direction, turning as much as 180 deg thus coating more than the facing surface of the articles. This feature is termed "wrap-around" and accounts for the ability of the process to coat edges and other areas so difficult and costly to cover with hand spray or old mechanical methods.

The sprayed material is directed down the line of articles and is attracted to them by the compelling forces of the electrostatic field. Very little coating material escapes beyond the electrod system. Overall efficiency is extremely high.

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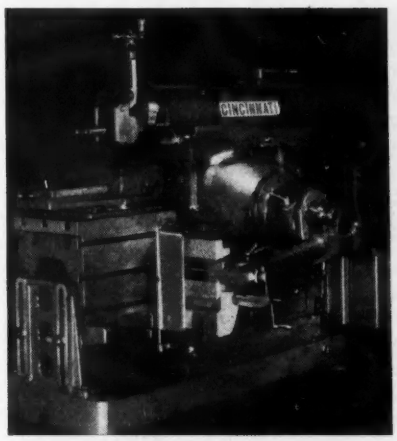
of Meehanite against a special bi-metallic friction material.

The unique feature of the feeding motion is that it is actuated by a series of cams and not by an eccentric and ratchet, nor by a single step cam. This enables the entire feed under any conditions to be confined wholly within the return stroke. This eleven-step cam is cut from the solid in one piece.

Another feature of the general arrangement is the omission of the usual feed box on the end of the cross rail and the transfer of this mechanism to the side of the column. This removes it from a position that encroaches upon the operator's working space.

Eleven feeds, ranging from 0.010 to 0.170-in. (from 0.005 to 0.085-in. optional) are provided. The amount of feed is



*Cincinnati 24-in. heavy duty rapid traverse shaper.*

controlled by means of a lever, mounted on a direct reading dial, indicating the feed in thousandths. Three-quarters of one turn changes the feed from the minimum to the maximum—a roller drops into the desired cam step, and the dial shows the feed. A second lever for feed engagement has a stop, a right, and a left position, and indicates the direction of the table movement. All feed changes may be made while the machine is running.

Length of stroke is maintained without the usual clamping nut on the stroke-adjusting shaft. Locking of the stroke adjustment takes place automatically. The length of stroke may be changed while the ram is in motion. The indicator dial shows the setting for the length of stroke at all times, with the ram in motion or stopped. A safety

## E-77—Rapid Traverse Shapers

The Cincinnati Shaper Co., Cincinnati 25, Ohio. Power rapid traverse shaper. This shaper is made in eight sizes from a 16 in. machine to a 36 in. heavy-duty model. Features include power rapid traverse to the table, automatic oiling, internal transmission, cam feeds and direct reading indicators.

The internal transmission provides eight selective speeds covering a wide range. Changes are made by two levers within reach of the operating position. The gears are chrome-nickel steel, heat-treated, and run in oil. They shift on solid splined shafts supported at both ends and are placed entirely within the column. The clutch has friction surfaces

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guard covers the stroke-adjusting shaft.

A special feature is length of the ram bearing which is the same length as the ram. Thus the ram bearing extends out to the swivel head reducing the overhang from the ram to the tool to a minimum. The movement of the ram clamp lever is limited in its open position, so that no damage will result to the ram positioning screw should the operator accidentally fail to clamp it before starting a cut.

## E-78—Roto-Matic Machine Tools

Davis and Thompson Co., 6411 W. Burnham St., Milwaukee 14, Wis. Roto-Matic machine tools designed with a view towards continuous operation. This limits loading time and makes it necessary to embody automatic clamping or quick hand clamping of work pieces. Predetermined feeds fix the available time for this operation and set the pace for the machine operator.

The No. 1-A Roto-Matic is a continuous rotary double-end drug-type milling machine with automatic chain clamping for rough and finish milling front suspension control arm trunnions.

The No. 2-A Roto-Matic also is a continuous rotary double-end drum-type milling machine, equipped with a fixture designed to take a variety of sizes of bearing caps while rough and finish milling bottom, joint faces, sides and ends. Cutter spindles all have micrometer endwise adjustment. In addition, the finishing spindles have patented adjustment for heel clearance of cutters.

Another new Roto-Matic is the 8-LV vertical eight-spindle continuous drilling machine with each spindle having a two-spindle drill head for drilling two 33/64 in. holes in the spindle arms. Clamping of the pieces is automatic. Feed of spindles is through a fixed cam.

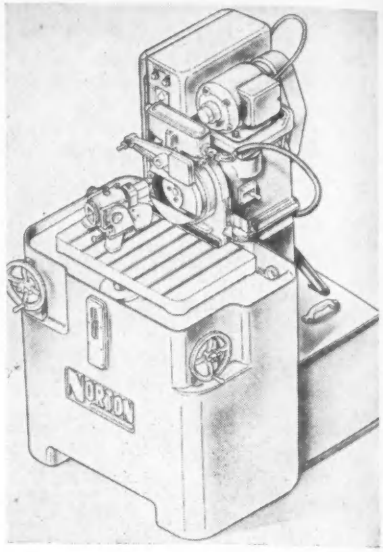
The 12-V Roto-Matic is a vertical twelve-spindle continuous drilling machine. Six spindles are provided with fixtures for drilling 1-7/8 in. holes in one type gear, while the other six spindles drill 1¾ in. holes in another type gear. Clamping and feed of spindles is automatic.

## E-79—Tool Grinder

Norton Co., Worcester 6, Mass. A tool grinder of new design for grinding convex single point tools. Model tools can be made quickly on the Bura-Way grinder by using the protractor and angle setting attachments. Templates are made from master or model tools with the use of calibrating block and template grinding step block. The machine, therefore, is not only a tool grinder but a template generator as well.

The capacity of the tool bit holder accommodates shanks up to two in. square and is of the universal type. It rolls and tips angularly and is arranged so that the tool may be fed to the wheel in increments of thousands. Such a feature removes the need for unclamping and reclamping. Relief angles up to and including 15 deg. may be ground; side rake angles (positive or negative) up to and including 30 deg; and back rake angles (positive or negative) up to and including 25 deg.

Wheel spindle oscillation is an important feature as it removes the need for oscillating the tool holder by hand. Total oscillation is ⅛ in. and is not adjustable. A movable wheel head unit is used with the motor mounting fixed on its top. Idlers adjust the belt tension.



*Norton No. 2 Bura-Way tool grinder*

To insure easier maintenance and servicing all electrical controls are mounted in a water and dust-proof cabinet. Electrical controls are so arranged that coolant pump operation is tied in with that of the wheel spindle. The coolant tank capacity has been increased to 25 gal and added baffling in the new tank design results in cleaner coolant.

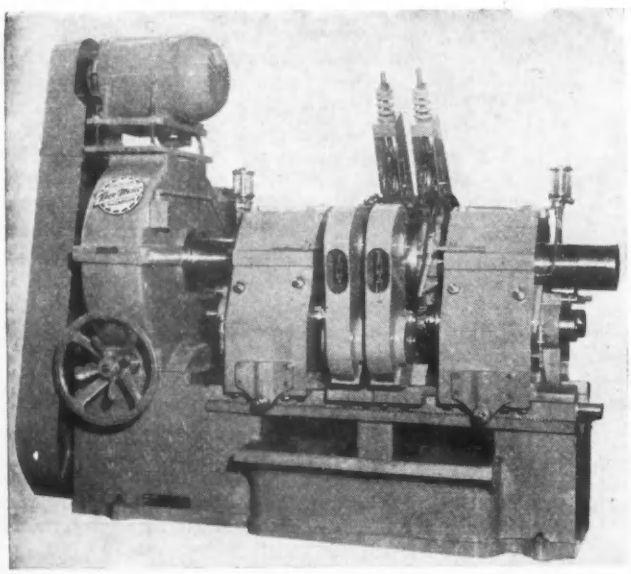
## E-80—Template Tool Bit Grinder

Oliver Instrument Co., Adrian, Mich. A 20 in. template tool bit grinder for the purpose of grinding single point tool bits to a predetermined contour and with any combination of clearance angles as required.

The machine consists of a heavy frame supporting a spindle on which is mounted a 20 in. by 2 in. grinding wheel and is driven by a three hp motor. A separate ½ hp motor drives the template maker. An ample supply of water is available on the tool, approximately 25 gal per min.

The feature of the machine is the type of holder used in grinding the tool. The holder consists of an iron frame supported at the lower end by a heavy ball and socket joint and having located at its upper end a template which is a double size replica of the tool point. Midway between the template and ball joint is a mortice in which the tool is inserted. A setting gage provides a means for inserting the tool so that just the correct amount may be removed from the end thereof.

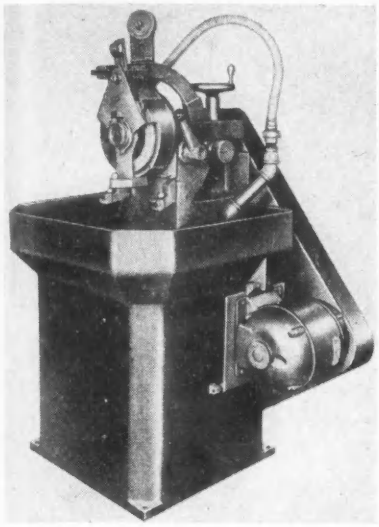
On the wheel guard which envelopes the grinding wheel is a ball joint and a straight edge so arranged that when the tool holder is placed in a working position the tool will contact the wheel and the surplus material will be ground off until the template touches the straight edge, then the tool will be



*Davis and Thompson No. 1-A Roto-Matic.*

ground to the exact profile of the template, only half size.

The supports for the tool holder are located on a carriage which can be moved in relation to the face of the wheel to give the proper clearance, and the wheel guard swings on a pivot to



*Oliver 20 in. template tool bit grinder*

compensate for the wear of the wheel. For any position of the carriage the clearance stays constant regardless of the diameter of the wheel.

The machine will grind tools up to 1½ in. wide by 1¾ in. high and from 0 to 20 deg clearance. Special shapes, odd sizes and various combinations of clearances may be ground in special tool holders or adapters.

For most combinations of clearance angles required on tools the tool bit is inserted directly in the tool holder, using a nest for the given size tool. There may be, however, certain combinations of clearance angles which seem desirable, that may require a special tool nest which is very easily provided.

## E-81—Plain Hydraulic Grinder

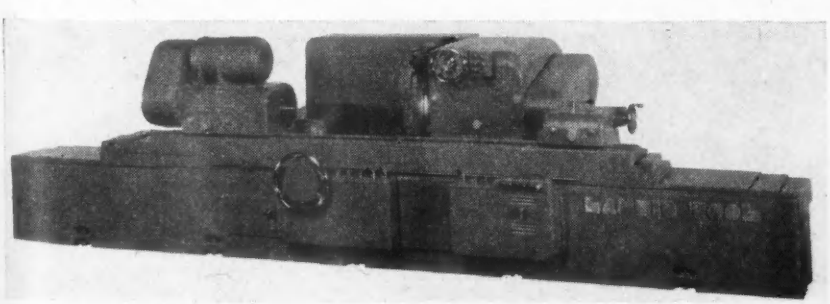
Landis Tool Co., Waynesboro, Pa. Type F model 14 x 96 in. plain hydraulic grinder. This machine has a basic swing of 16 in.; but, depending on application requirement, it can be furnished as a 14 in. or raised to swing 20, 24, 30 or 36 in. Between center lengths are 48, 72, 96, 120, 144, 168, 192, 216 and 240 in. Wheel diameters can be 30, 36 or 42 in. Weight carrying capacities of 6300 or 10,000 lb are available in plain, gap and roll grinder designs. Roll grinding equipment includes the Landis Tool crowning and concaving mechanism.

Hydraulic traverse of three to 90 in. per min is provided by an adjustable speed hydraulic motor through a gear train to a carriage rack. Change in hydraulic oil viscosity does not affect traverse rate. Varying loads do not affect the traverse rate after it is set. The hydraulic mechanism is mounted on the bed front in such a manner that it may be removed as a complete unit for servicing.

The wheel and headstock drives are all Vee belt. Hydraulic and lubricating oils have individual reservoirs and pumps; the coolant pump is installed in the rear of the machine in a three-compartment, 180-gal tank section. The tank is baffled to settle suspended solids with the pump supplied from the clean compartment. A hinged fender side provides access to the grinding wheel.

Landis Microsphere bearings carry the wheel spindle. They are lubricated from a wheel base reservoir having an individual motor and filter. The bearings are sealed and pressure must be built up in the bearing housing before rotation can start.

Four kinds of infeed to supplement the hand wheel feed can be supplied: a hydraulic rapid infeed and slow cross feed for production work; an electric rapid infeed which is generally used for small lots or widely varying diameters; an automatic feed which functions at each or either reversal of carriage, and can be used with hydraulic or electric rapid infeed; and a hydraulic rapid infeed with direct acting dash pot, which is used where long, slow feeds against checks, webs or faces are required.



*Landis Tool 16 x 96 in. type F plain hydraulic grinder*

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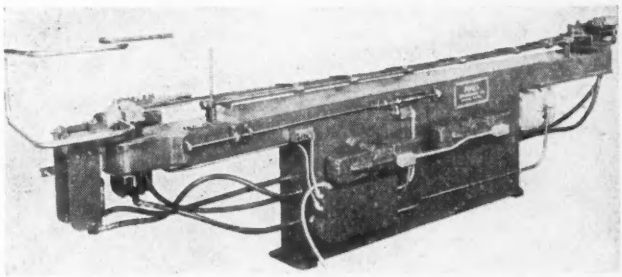
## E-82—Automatic Bending Machines

Pines Engineering Co., Aurora, Ill. Hydraulic tube bending machines. These bending machines are fabricated from heavy steel plate, arc welded and reinforced for rigidity. The entire base of the machine serves as a reservoir for hydraulic oil and all piping for the hydraulic system is directly above the oil reservoir. The hydraulic pump is mounted inside the base and the motor, which drives the pump, is mounted outside the base where it is easily accessible for repair and exposed to circulating air. The main control unit is a portable switch which is equipped with a start button, a stop button and a reverse button. The machine is started by the momentary contact of the start button, after which clamp closes, pressure die closes, bending arm rotates to a predetermined angle, mandrel is extracted, clamp opens, and pressure die opens.



*Pines No. ¾ bending machine*

Pressing the return button brings the bending arm back to starting position, after which the mandrel automatically advances to working position. The third or red button is used to stop the machine in an emergency at any point in the bending cycle. It also aids in the original set-up by permitting the inching of the clamps or of the movement of the bending arm. An automatic cycle switch is supplied which, when closed, will cause the machine to go through the entire cycle described above by using the start button only.

The bending arm is arc-welded of steel castings and steel plates. The spindle of the bending arm is pressed

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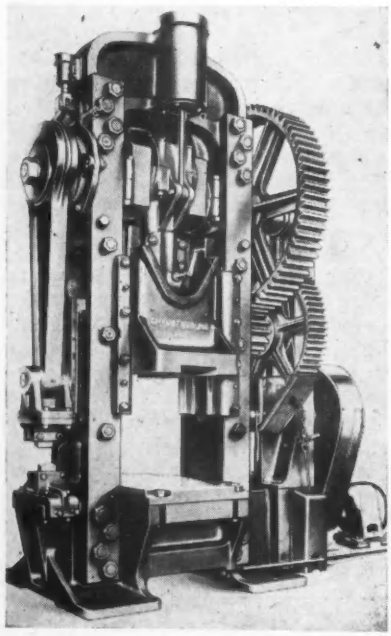
into a bored hole in the steel casting, after which the spindle is welded into place and machined. This prevents any lost motion developing in operation and is an important factor in maintaining accurate angle of bend.

The sprocket which drives the spindle is bored with a tapered hole, mounted on the tapered spindle and locked by a large key. This construction permits ease of assembly or dismantling and also insures that the key will not work loose in service.

All Pines bending machines can be purchased with hydraulic mandrel extractor if required. A cylinder of proper stroke can be supplied to suit requirements where extremely long flexible mandrels are used in the bending of extruded shapes. The control of the mandrel extractor cylinder is by separate hydraulic valve, eliminating any sequence valve which might permit the clamps to open and leave the tube on the mandrel.

## E-83—Trimming Press

Chambersburg Engineering Co., Chambersburg, Pa. Steel side trimming press. Designed primarily as a trimming press for forge shop use, this tool can be used for all forms of blanking, punching, bending and shaping. It is designed with forged steel side frames tongued and grooved to bind the base and yoke into a rigid unit. A friction slip mechanism permits the flywheel to expend its energy at predetermined loads, and prevents locking, jamming and breakage when the press is stalled through overload, the manufacturer states. An important feature is the accessibility to front and back, which has been achieved by arranging the flywheel and gearing at the side of the press. It is furnished in single-crank and double-crank models.



*Chambersburg trimming press.*

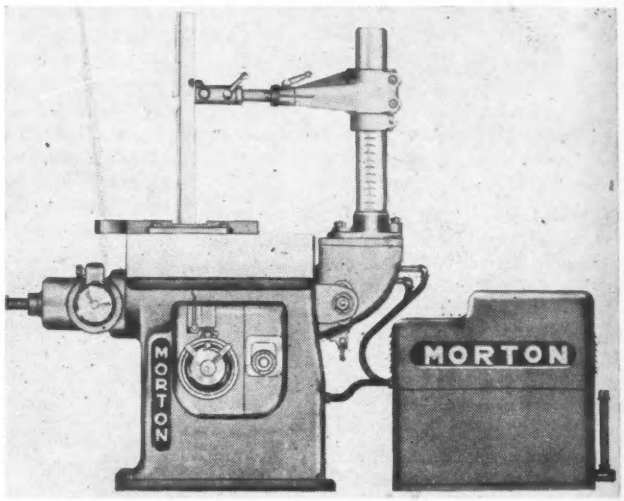
## E-84—Keyway Cutter and Slotting Machine

Morton Manufacturing Co., Broadway and Hoyt, Muskegon Heights, Mich. Hydraulically driven keyway cutter and slotting machine. This machine is made in 18-in. and 24-in. stroke sizes. The top plate is provided with six accurately machined T slots which form a surface for securing the rapid binding attachment for holding down the work. The top plate is stationary and the necessary taper is secured through tilting the cutter bar. Tapers up to ½ in. per ft forward or one in. per ft backward can be quickly set. The work is centered to the bore by placing the work against centering jaws, thereby eliminating step bushings and other less efficient methods.

Automatic feeds are provided, giving a variable rate of incremental feed from 0.001 to 0.020 in. per stroke. Automatic relief to the cutter bar on its return stroke is provided. The operating height from table to floor approximates 40 in. The cutting speed range is 10 to 25 fpm with a quick return speed of 75 fpm. The floor space required approximates three ft wide by eight ft long.

This machine is regularly equipped with rapid binding attachment, auxiliary top plate, adjustable centering jaws and special heavy-duty upper bar backing support and post. This Morton hydraulic is a multi-purpose tool; many slotting operations can be performed on it as well as general and production keyseating.

An advantage of the new Morton keyway cutter and slotting machine is that the work remains stationary at all times. Taper keyways in straight bores or straight keyways in taper bores are obtained without any special features for tilting the work.

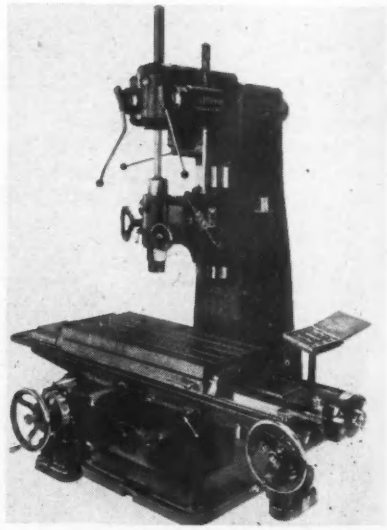



*Morton hydraulically driven keyway cutter and slotting machine*

## E-85—Jig Borer with Electronic Control

Cleereman Machine Tool Co., Inc., 400 W. Madison St., Chicago 6, Ill. An electronically controlled jig borer. This new machine, the manufacturer states, can locate and bore holes and locate and mill surfaces to "tenth" limits.

Power drive is secured by two individual motors, one for each direction of table travel, with the speed controlled by a common electronic panel so that the proper rate of feed can be obtained for milling in all directions. In addition, a power rapid traverse rate of 50 in. per min is available for indicating and aligning work, for rapidly advancing up to the milling cut, and



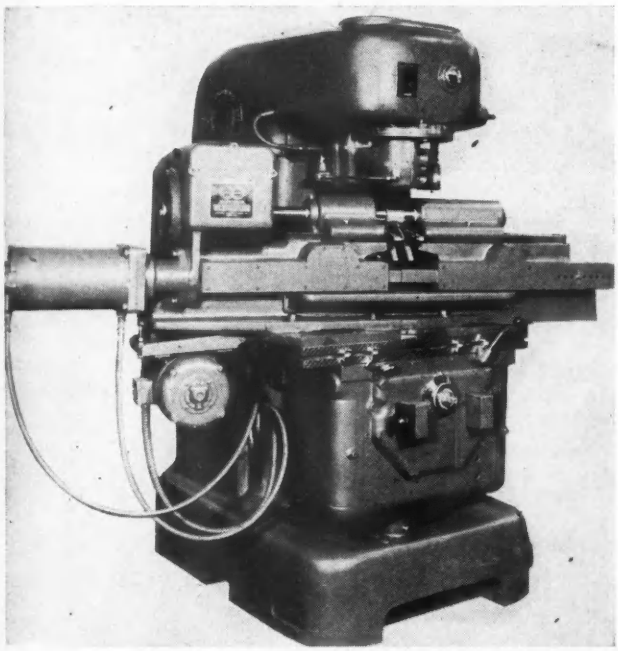
*Cleereman electronically controlled jig borer*

for pre-positioning work before boring.

For pre-positioning work a "creep" speed is put into operation by limit switches built into the dial indicator housing. The correct amount of end measuring rods are placed in the trough and the table moved at rapid traverse rate toward the dial indicator; contact with a limit switch slows down the motor by dynamic breaking to a "creep" speed until the measuring rods contact the dial indicator and the table stops in the correct position. Although in many cases no manual adjustment is necessary, the table may also be positioned by fine hand feed. This new development permits a degree of positioning unusual in a jig borer, it is said.

## E-86—Rotor Finishing Machine

National Broach and Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. Red Ring RotoShaving machine for finishing the rotor laminations of electric motors. This machine finishes rotors from the rough in one operation by combining three principles: the use of a fine-pitch, high-precision cylindrical milling cutter operating at high speed; the principle of crossed axles shaving; and the principle of diagonally traversing the work across the cutter in order to spread the cutter wear uniformly over its full face and obtain optimum tool life. The net result, it is claimed, is accuracy comparable with grinding, a reduction in machining time and no closing of the laminations or burring of the slots.



*Red Ring machine for finishing the laminated diameter of electric motor rotors by roto shaving.*

The cutter head of the machine is adjustable to provide a wide angular range between work and cutter axes. In addition to this, the table has a 15-deg swing in its horizontal plane to provide the diagonal angle desired. The knee is adjustable vertically for different diameters of work. Table travel, adjustment of head and tailstocks and knee are sufficient to accept rotors having a wide range of shaft lengths, face widths and diameters.

The manufacturer states that a rotor of 3¼ in. diam and two in. face width can be completely finished with one pass in 16 sec. Approximately 0.030 in. of stock on the OD is removed to a finished tolerance of less than 0.002 in. Loading time is approximately four sec. Air operated head and tailstocks and a work locator is provided to facilitate loading.

## E-87—Inclinable Punch Presses

Walsh Press & Die Co., Chicago 44, Ill. Ten new models of open back inclinable punch presses ranging in capacity from 6 to 90 tons. Drive is by multiple V-belt with the motor mounted on top of presses. Crankshafts are of forged alloy steel, normalized and ground. A safety lock prevents press from operating while changing dies. All clutch parts are of alloy steel, hardened and ground. Bearings are lubricated from pressure grease fittings. An overload relay prevents damage to motor if a die should jam. A special cast running bushing is fitted between the flywheel and crankshaft bearing. Ram bearings are precision scraped to assure best possible bearing alignment between gibs and ram. The punch holder is held by means of a cylinder clamp or can be fastened to the ram by means of three properly spaced mounting screws. Bed and face of ram line up within 0.002 in.

Safety of operation is enhanced by the Walsh two-button safety and nonrepeat device which is standard equipment on all Walsh presses, and which is applicable to power presses of all makes.

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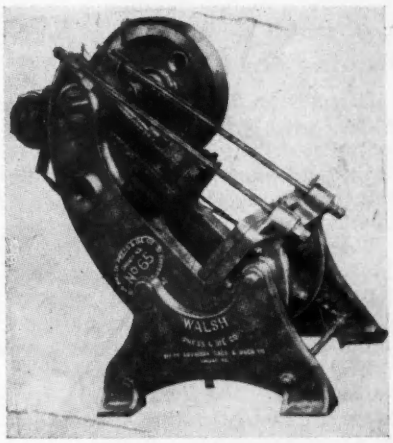
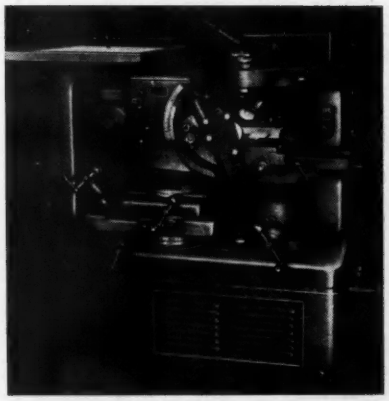


*Walsh No. 65 inclinable press*

## E-88—Precision Profile Grinder

The Wickman Corp., 15533 Woodrow Wilson Ave., Detroit 3, Mich. A high precision profile grinder which provides for the grinding of any desired profile in tungsten carbide, or other hard metals, directly from the drawing. The principal feature of this machine is that it makes the grinding operation and the accuracy to be achieved entirely independent of the wear of the grinding wheel. This machine allows checking of the finished product for accuracy without removing it from the machine, and by the drawing from which it has been produced. It thus eliminates projection of the part on an optical projector. Flat and circular form tools may be ground.



*Wickman high precision profile grinder*

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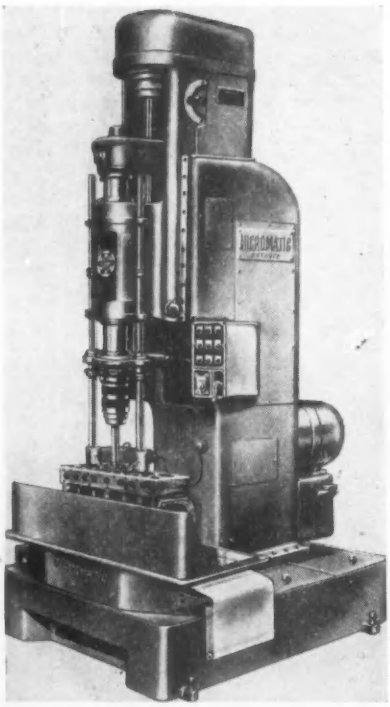
## E-89—Quill Type Honing Machine

Micromatic Hone Corp., 8100 Schoolcraft Lane, Detroit 4, Mich. A unit-constructed, single spindle, heavy duty honing machine with quill type spindle for honing bores from 1 in. to 4 in. diameter up to 9½ in. long.

These machines are made up with the following three units assembled on the column and base of any other Micromatic Microhoning machine: The spindle, hydraulic control panel, stroke control mechanism, and speed control transmission which are all in one integral assembly; the hydraulic unit which comprises the hydraulic pump, tank, and pressure control valves; and the electric control panel.

This design and construction reduces the amount of hydraulic piping and fittings, thus reducing the possibility of leaks.

To permit faster stroking without increased power input, all weight that must be reciprocated to stroke the tool has been minimized. All head and guide bars have been eliminated—the spindle is the piston rod with rings that act as the piston. Stroke control is more positive and accurate because it is direct, without linkages or levers. Accuracy of spindle alignment with the work is said to be assured, because torque and thrust are taken by the quill closely above the tool.



*Quill type Michrohoning machine with lateral indexing fixture, and with automatic Microsizing control*

## E-90—Induction Heating Machine

The Ohio Crankshaft Co., 3800 Harvard Ave., Cleveland, Ohio. The 750 watt 450,000 cycle TOCCOtron, a bench-type machine designed primarily for silver brazing and soldering, but also adaptable to hardening, annealing and forging applications within its power capacity.

*The 750 watt TOCCOtron brazing bellows assemblies.*

The TOCCOtron is suitable for both automatic or manual operation. It is designed to operate continually at full load for mass production work, yet is adaptable to quick set-up changes required by job-shop or tool room operations. Inductor coils can be made by forming copper tubing or wire to the required shape.

The unit is of the tube oscillator type. It operates from a 110/120 volt a-c single-phase 60 cycle current source, and is tapped to accommodate either single or multiple-turn inductor coils. An outstanding feature is the fact that the new unit requires no water connections. The machine measures 29 in. long by 16½ in. high by 19¼ in. deep, and weighs 225 lb.

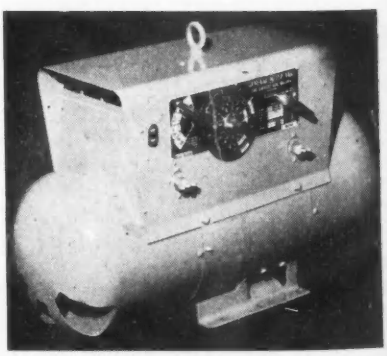
## E-91—Heavy-Duty D-C Arc Welders

General Electric Co., Schenectady 5, N. Y. A new line of heavy-duty single-operator d-c arc-welding machines, Type WD-40 series, operating at 3500 rpm. The new welders are available in 200, 300 and 400-amp ratings.

The arc is said to be easily established and maintained with the new welders because more than full arc voltage is generated instantly after short circuit, thereby largely eliminating arc pop-out, and excessive weld spatter is reduced because current peaks are adjusted for best performance on any setting.

New single-dial, dual control is provided. This feature makes it possible for the operator to preset the correct current for any given job without having to make other adjustments after the arc is struck. With this current presetting arrangement, a tap switch handle in the form of a pointer is set to the electrode size being used. It then automatically points out the proper one of several graduated scales on the face of the current-setting dial. This indicates the current range which should be used and permits precise adjustment of the welder output.

Short-circuit current peaks are adjusted to provide a stable arc with optimum striking characteristics. Instant recovery voltage is never less than arc voltage on any current adjustment, assuring high-quality welding over the machine's entire range of current. This also facilitates striking the arc. Quick response and control of overshoot, it is said, makes this machine favorable for vertical and overhead work without excessive spatter. A broad current range makes it pos-



*G-E WD-40 high-speed d-c arc welder*

sible for all models to handle a wide variety of work.

To facilitate inspection and maintenance, weather-resistant end covers on both the welder and the control box can be removed with a screwdriver, making the motor, generator, commutator, brushes, and controls accessible.

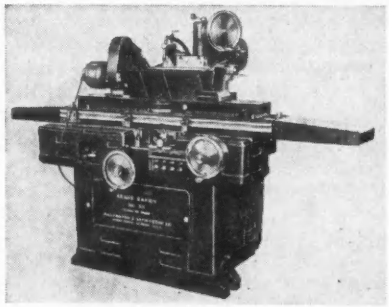
The standard assembly includes a stationary welding generator, driving motor, control cabinet and panel, and a motor starter assembled into a single unit. A two-wheeled, balanced running gear is available as an optional feature.

## E-92—Hydraulic Feed Universal Grinder

Gallmeyer and Livingston Co., Grand Rapids 4, Mich. New hydraulic feed universal and tool grinders, No. 70 and No. 80. The No. 70 differs from the No. 80 only insofar as the capacity between centers and amount of longitudinal table travel is concerned.

These machines are equipped with a hydraulic mechanism which provides for an unlimited number of longitudinal table speeds ranging from 6 ipm to 50 fpm. The hydraulic mechanism and the motor for driving same are completely housed within the base of the machine. The speed of the longitudinal table movement is controlled by a lever conveniently located on the front of the grinder.

The machine is equipped with a greased-for-life dust tight cartridge type precision ball bearing spindle. All rotating shafts are mounted on grease sealed ball bearings and a Bijur one-shot system provides for the lubrication of the machine proper.



*Grand Rapids No. 80 hydraulic feed universal and tool grinder*

The vertical movement of this machine is provided with dovetailed ways on the two sides of the raising and lowering column which are protected against grit and dirt by telescopic guards. Should wear eventually occur, it may be compensated for by means of a tapered gib.

A four-speed motor drive headstock providing for work speeds of 80, 160, 260, and 525 rpm is standard equipment.

Magnetic starters are housed in a compartment in the side of the column with the separate push buttons placed in a control panel conveniently located on the front of the grinder.

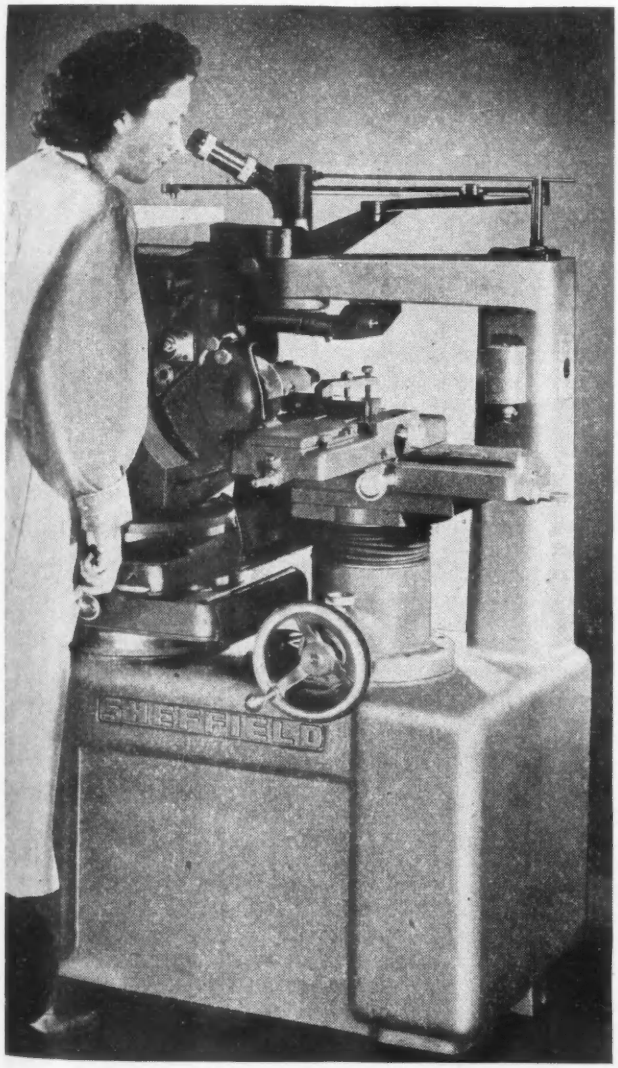
# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

## E-94—Flat Surface Grinding Machines

Gardner Machine Co., Beloit, Wis. Two new 26-in. flat surface grinding machines, the No. 626 for parallel surfacing operations, and the No. 526. The No. 626 is equipped with a feed-through type of fixture so that parts having parallel flat surfaces will pass through between the opposed abrasive members in a constant stream, one piece following the other in a continuous operation.

The No. 526 is a single-head grinder, equipped with a power-operated oscillating work table. The grinding head is also mounted on a power-actuated slide, thus reducing the required manual operating effort to a minimum. Both machines embody the following general features: precision spindle and bearing construction; ball bearing ways; dial indicators to show head infeed; remote-control sensitive head feed mechanism; and adaptability to face or shear-cut grinding.




## E-93—Micro-Form Grinder

***The Sheffield Corp., Box 893, Dayton 1, Ohio. The Micro-Form grinder, a precision grinder designed to finish grind directly from drawings. It is said to be especially suited for the grinding of both circular and flat form tools, templates, profile gages, cams and dies from hardened materials including tungsten carbide. The machine is not limited by the regularity or irregularity of the work, nor by straight lines or irregular curves. Also, the Micro-Form grinder can be used reversely for making 50 to 1 layout drawings from parts with unknown profiles and for checking parts against layout drawings.***

## E-95 Light Engine Lathe

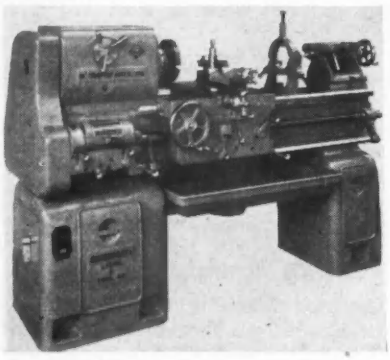
Cincinnati Lathe & Tool Co., Cincinnati 9, Ohio. A new series of light motor driven geared head engine lathes. This new line designated the Tray-Top Cintilathe is intended to meet the demands for a light duty, low cost lathe, and is offered in four nominal swing sizes, 10, 12.5, 15, and 18 in., with distances between centers from 18 in. and up in increments of 6 in.

Ease of operation is emphasized by the convenient grouping of controls placed at the normal working position of the operator. This permits effective use of the wide range of 12 spindle speeds. The standard range on the 10

## NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

in. and 12½ in. size machines is from 30 to 1200 rpm, the standard range on the 15 in. and 18 in. size machines is from 20 to 820 rpm in geometrical progression with an overall ratio of 41 to 1. Optional high spindle speed ranges are available at a slight extra charge of 45 to 1800 rpm on the 10 in. and 12½



***Cincinnati 15 in. Tray Top Cintilathe***

in. sizes and 30 to 1200 rpm on the 15 in. and 18 in. sizes. Speed changes are obtained by a three lever shifting arrangement in which all three levers operate on a common center with a direct reading speed dial conveniently located.

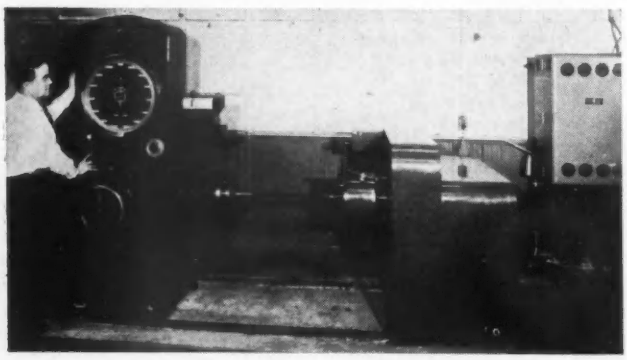
All shafts in the headstock are Timken bearing mounted and the entire transmission is lubricated by a splash system. The spindle on the 15 in. and 18 in. sizes is mounted on two Timkens and one straight roller bearing. The spindle on the 10 in. and 12½ in. sizes is mounted on two Timken bearings. The hole through the spindle is of generous proportions, being 1¼ in. on the 10 in. and 12½ in. size machines, and 1½ in. on the 15 in. and 18 in. size machines. The spindle is provided with the standardized taper nose, the 10 in. and 12½ in. sizes using the LOO, and the 15 in. and 18 in. sizes using the LO spindle nose.

The machine is offered with two optional drives, one with direct coupled motor drive whereby the starting and stopping and reverse is by means of an electrical drum switch which incorporates a jog position or alternately it can be equipped with a multiple disk friction clutch and brake. In either case a vee belt drive is employed and apron control is standard on all machines. A wide range of thread and feed changes are provided; 48 thread and feed changes are incorporated. The 10 in. and 12½ in. size machines have a thread range of from 3 to 184 and a feed range of .0019 in. to .1215 in. feeds per revolution. The 15 in. and 18 in. machines have a thread range of 1½ to 92 threads and a feed range of .0019 in. to .1215 in. feeds per revolution.

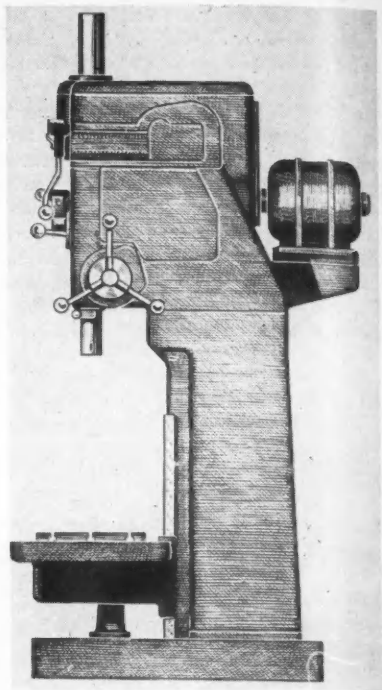
All moving parts in the change gear box run in oil. Impregnated self-lubricating plain bearings are also utilized. A one-shot system is supplied as standard equipment for the complete lubrication of the carriage bearing and cross slide unit. The apron is a self-contained unit will all moving parts operating in oil.

### E-96—Torsion Testing Machine

Tinius Olsen Testing Machine Co., 500 N. 12th St., Philadelphia 23, Pa. Torsion testing machine. This new torsion-testing and strength-testing machine can measure all degrees of twist and increments of stress loading, up to the point of failure of the specimen. An electrically actuated recorder provides maximum accuracy. Maximum twisting capacity of the machine is stated to be 120,000 lb-in. Rotating speed of the twisting force ranges from two to 180 deg per min, and is controlled through electronic controls and a variable speed motor. Speeds can be accurately maintained within one deg, plus or minus, it is claimed. The motor drive a heavy-duty worm gear reducing unit which in turn applies the torque load to the specimen under test. The worm gears of the reducing unit run continuously in an oil bath. The machine is furnished with a multi-masked, range-selector type of dial. Maximum length of solid bar specimens to be tested is limited to five four in., and three in. in diam.



***Olsen torsion testing machine***



### E-97—Improved Drill

***Barnes Drill Co., Rockford, Ill. A new mechanical drill which embodies all the desirable features of the original Barnes line of drilling machines, and in addition, has modern features which equip it to meet present production demands. Some of the outstanding features are: 12 speeds and nine feeds, each selected by dial control; improved feed engagement control and wider range of speeds and feeds.***

### E-98—Broaching Machines

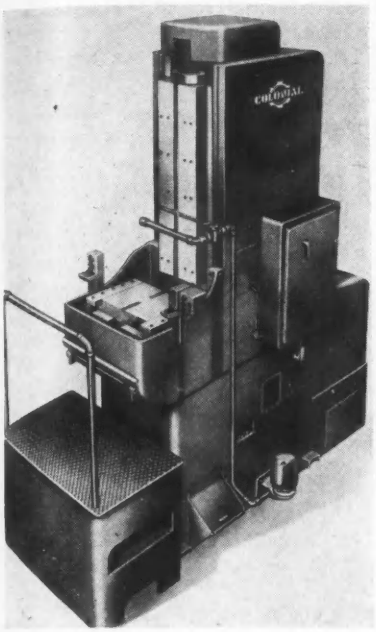
Colonial Broach Co., Detroit 13, Mich. Three new lines of vertical broaching machines, consisting of both pull-up and pull-down types, and of single ram surface broaching machines, offered in a complete range of standard tonnages and strokes.

The new Colonials have an entirely new hydraulic system layout, with hydraulic pumps mounted outside of the machine housing, where they are immediately accessible. For protection, they are provided with a light wieght enclosure. A new air circulation system for the motors and hydraulic system provides maximum cooling, permitting sustaining of high peak loads.

All valves are gasket mounted with pressure seals so that any valve unit can be individually removed if desired without disturbing the piping, draining the system, etc. Filters are accessible for inspection and cleaning without draining the oil and while the machine is running. A large capacity hand-pump is provided for quickly priming the automatic lubrication system if the machine for any reason should not have been in use for a considerable length of time.

All hydraulic controls are group

mounted in a single cabinet just inside the inspection door on one side of the machine. Electric controls are similarly group-mounted on a single panel on the opposite side of the machine, back of the inspection door which encloses them and protects them against dust and drit. The new machines are fitted with a



*Colonial single ram surface broaching machine.*

lubrication system which provides high pressure lubrication by means of a self-priming pump.

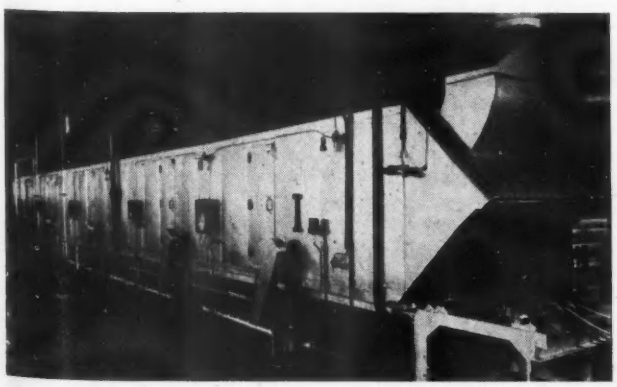
Increased output per hour has been secured by making provisions for increased return speeds for the rams. Columns have been further strengthened by heavier internal ribbing and reduction in the number of openings in the column.

## E-99—Coating and Lithographing Oven

Young Brothers Co., Detroit 7, Mich. A new continuous conveyor coating and lithographing oven. This new oven provides for a wide variation in operating temperature and has each zone equipped with individual heating, recirculating, temperature control, ignition and safety equipment. The new unit makes possible a great degree of flexibility of operation and baking temperatures for the new coatings can be varied over a wide range.

The new unit also includes a recuperating zone which recovers the stored heat in the metal sheets and injects this heat back into the baking zone before the work leaves the insulated enclosure, at the discharge end of the oven. Heat calculations and operating data indicate that the installation of this recirculating type of recuperative cooling system has produced substantial savings in fuel consumption. It is said the recuperative cooling system, operating in an oven handling a production of 3500 sheets per hr, and at a baking temperature of 400 F has resulted in the recovery of approximately 30 per cent of the total Btu.

The oven is so designed that the burners are within the oven proper and so located that there is no danger of overheating of the sheets, due to direct radiation. The temperature is controlled with a modulating type fo controller, which controls the heat input from each burner in each zone. Zone control is said to allow gradation of heat to provide the ideal temperature required in each phase of the drying and oxidation of the coating or ink.



*Young continuous conveyor and Lithograping oven.*

## E-100—Multiple-Speed Snagging Grinder

The Standard Electrical Tool Co., 2469 River Rd., Cincinnati 4, Ohio. Redesigned No. 30 multiple-speed snagging grinder. This machine is now available in sizes for 18-in. wheels up to 30-in. wheels. It is provided with three spindle speeds so that grinding efficiency may be maintained throughout wheel life by changing the spindle speed as the wheels reduce in diameter. An interlocking arrangement is said to prevent overspeeding of the wheels.

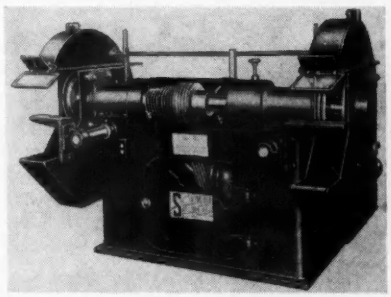
The No. 30 grinder incorporates heavy-duty ball bearings which are fully protected and includes liberal size oil reservoirs fitted with sight feed oil gages. This design also includes a shaft lock for use in changing wheels. Power is transmitted to the grinding spindle through multiple V-belt drive. The adjustable sheave

# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

on the grinding spindle is readily accessible through a hinged cover.

The wheel guards of the machine are boiler plate steel, with adjustment to compensate for wheel wear. Each



*Standard Electrical Tool redesigned No. 30 multiple-speed snagging grinder*

guard is equipped with an adjustable spark breaker and shatter-proof glass eye shield. Moreover, an adjustable and removable work rest is provided at each wheel.

The three-step sheaves on the grinding spindle and motor drive are furnished for either vitrified bond or resinoid bond grinding wheels.

## E-101—Balancing Machine

Bear Manufacturing Co., Rock Island, Ill. Model 375 industrial static and dynamic balancing machine. This machine is equipped with a roller adjustment which, the manufacturer states, enables the operator to change the machine set-up from a one-in. diam. shaft to a five-in. diam. shaft in a very few minutes. Also, it is said, the towers can be moved along the bed of the machine very easily through the medium of a rack and pinion. This adjustment enables the operator to change set-ups rapidly where the length of the parts to be balanced varies.

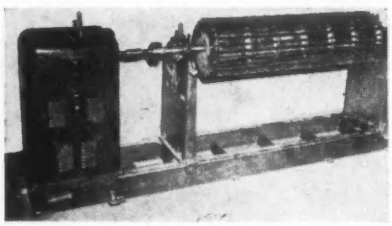
For driving purposes, a Curtis double universal-joint type drive is employed. To this can be affixed either an adapter or a three-jaw, self-centering, balanced scroll chuck. One three-in. and one five-in. chuck are available for use with this machine. In keeping with the roller adjustment and the tower adjustment, the self-centering type chucks also lend to the simplicity of changing set-ups. This type chuck, it is claimed, enables the operator to adapt the drive to any shaft diameter within the ca-

NEW
MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

pacity of the chuck in a very few minutes.

Another feature of this machine is the automatic spark indicating mechanism. This feature, plus the dial indicators that are mounted on the towers of the machine, enable the operator to



***Model 375 Bear industrial static and dynamic balancing machine***

remain at the control tower at all times regardless of the bed length, while the part is in motion. On the larger parts, this is desirable from the standpoint of safety. Also, each tower is equipped with a safety guard. These guards, when locked into position, will hold the shaft on the rollers and the part in the machine regardless of the amount of unbalance in the part.

The model 375 is being used in industry for balancing flywheels, belt pulleys, variable speed pulleys, hammer mill rotors, armatures, rotors, rollers, cylinders, cylindrical brushes, crankshafts and other similar parts.

## E-102—Heavy-Duty Engine Lathes

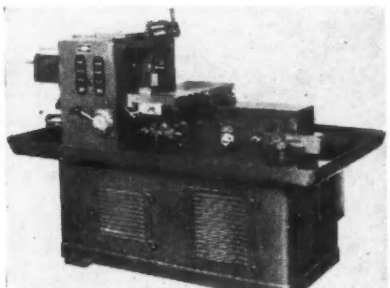
Axelson Manufacturing Co., 6160 S. Boyle Ave., Los Angeles 11, Calif. Three heavy-duty engine lathes designed primarily for the rapid removal of metal in turning operations. Features of these lathes are: A direct connected unimount motor which eliminates belts, pulleys and guards; a built-in reverse disc clutch which provides the same number of reverse speeds as forward; and a hydraulic disc brake which requires no attention by the operator for its action.

The gears in the headstock are forged of special alloy steel, heat treated, hardened and ground. They are wide faced, move along splined shafts as speed changes are desired. Lubrication is by an oiling system of pressure to the main Timken precision roller bearings on the spindle, and by splash and gravity elsewhere. The tailstock is a two-speed unit which is said to provide all the power needed in heavy drilling operations without the necessity of using an auxiliary bar in the handwheel. The high gear ratio permits fast removal of the drill from the work and fast return to drilling position at the same speed, with power reductions used only when needed.

## E-103—Automatic Lathe

The Oster Manufacturing Co., Cleveland 3, Ohio. The Oster No. 650 Rapiduction automatic cycle lathe for forming, facing and other cross feed operations. Capacity with standard collet is 1.5 in. Swing over cross slide is eight in.

Hydraulically operated cross slide, solenoid controlled valves and other control features provide an automatic cycle of fast approach, feed, dwell, fast retraction, and stop. The auto-

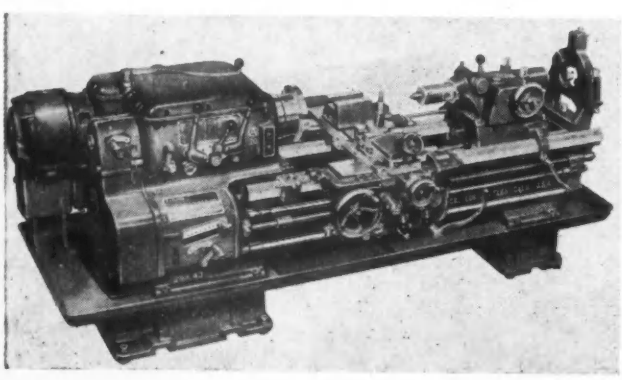


***Oster No. 650 Rapiduction automatic cycle lathe***

matic cycle of cross slide operations can be arranged for feed in one direction only or in two directions, as required. For set-up purposes, manual control is provided.

Regular equipment includes the bare machine (no tooling), complete with hydraulically operated, draw-back collet chuck with master collet (other work holding devices are optional), hydraulically operated cross slide with one or two directional cycle as required; motor-driven hydraulic pump and controls, four speed motor of the constant torque type, semi-magnetic speed control, and coolant pump with individual motor drive.

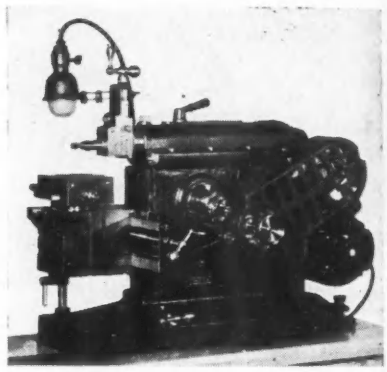
Overall dimensions of the new No. 650 lathe are: 79 in. long, 46.5 in. wide and 50 in. high. Net weight is 3000 lb.



***Axelson 20 x 43 in. heavy-duty engine lathe.***

## E-104—Small Shaper

Ammco Tools, Inc., Chicago, Ill. A seven in. four-speed shaper, available as a bench model or a portable cabinet model. Ways of the ram, tool head, and front face of the main frame are of the



***Ammco seven inch shaper.***

V type. These ways are hand scraped and all are gibbed and provided with adjusting screws to take up wear. The tool head is adjustable and graduated from zero to 90 deg for angle work; it is loosened or tightened by one screw. The down feed screw is provided with a graduated collar for adjustment.

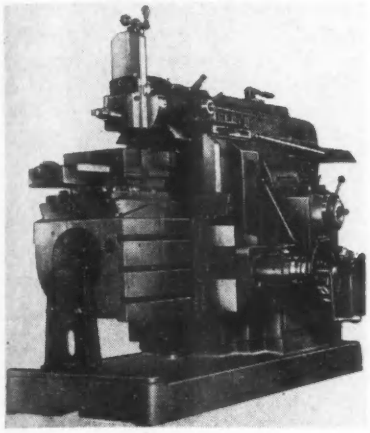
The cross rail and table ways are of the square type on the upper surfaces and of the V type on the lower surfaces, both with suitable gibs for adjustment. The table is provided with an adjustable support that bears on the machined surface of the main frame. The cross rail feed screw is constructed to provide a safety factor in that the table will run off the feed screw when it has traveled its maximum length in either direction.

The feed mechanism is of the adjustable and reversible type. Feeds vary from 0.003 in. to 0.018 in. The stroke is adjusted by loosening the lock nut on the end of the shank near the end of the feed eccentric and then by adjusting the rocker arm block. The proper stroke is indicated by a scale on the rocker arm.

The semi-steel vise is mounted on the table with a single bolt and held in position with a key. The base is graduated from zero to 90 deg on either side of center. Vise jaws are steel insert plates.

## E-105—Improved Universal Shaper

General Engineering and Manufacturing Co., 4417 Oleatha Ave., St. Louis 16, Mo. The Gemco universal-type shaper. Several improvements have been made to this shaper. Control of the power rapid traverse is now accomplished by an operating lever. The lever operates a positive type clutch that is built into the feed mechanism housing, which normally engages the feed power to drive the work table. When the lever is shifted,



*Gemco improved universal-type shaper*

the clutch engages the power rapid traverse. When the rapid traverse is engaged, it moves the work table automatically away from the work piece or opposite to the direction of feed power, thereby making it unnecessary for the operator to shift gears.

Selective feed or power rapid traverse for either horizontal or vertical movement of the work table is now obtained. The design permits this four-way control of feeds by means of a gear-shifting device at the operator's side of the crossrail. The hand wheel, normally used to position the work piece, serves a two-fold purpose as it is also employed as the gear shifting device. Pulling the hand wheel into an outward position engages the vertical power motion or feed. Pushing the hand wheel into an inward position engages the horizontal motion. Vertical feed, when employed, is geared down to approximately 1/12 of the normal horizontal feed range.

The oil pump, mounted on the side of the column, is accessible from the outside. The filter is now mounted on the side of the column for ease of inspection and cleaning.

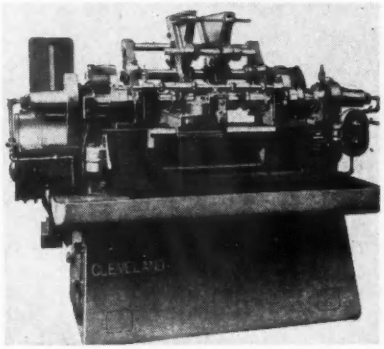
## E-106—Double-End Automatics

The Cleveland Automatic Machine Co., Cincinnati 12, Ohio. Two sizes of magazine-loading, double-end machines capable of handling a variety of special production, involving work at both ends of the piece, at a high rate of speed. The model J one-in. machine has the capacity for three-quarter in. pipe or one-in. bar stock in lengths from three in. to 11 in. The model J two-in. has a capacity for two in. pipe or 1.5 in. bar stock in lengths from 3.5 in. to 14 in.

The model J automatic differs from the usual automatic machine in that the work is held stationary and the tools revolved by two spindles, one at each end of the machine. Cam actuated motion carries the tools onto the work and automatically returns them. Blanks are fed to a chuck in the center which grips them while in work. When the piece is finished, jaws open, dropping it through angular chute to the pan. All controls, including starting and stopping switch and lever for engaging or disengaging the tool feed, are within easy reach of the operator. Indexing the machine by hand is accomplished by means of a crank which may be attached to a special indexing shaft located near the operating position.

The machine is equipped with a Cleveland hopper type magazine which is adjustable for length of parts. The magazine is arranged with oscillating levers timed from the cam shaft to control the dropping of blanks to sliding conveyor fingers which carry each blank to the air-operated center gripping chuck.

Two drums mounted on the main cam shaft carry adjustable cams which



*Cleveland Model J double-end automatic*

furnish tool fed motion to the two spindles. A disk on the same shaft operates the magazine feed control lever, and cams on the side of the left cam drum actuate the finger conveyors which deliver blanks from the magazine to the center chuck. Another drum, also driven by the cam shaft, operates the air cylinder which opens and closes the chuck.

# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

## E-107—Pacemaker Lathe

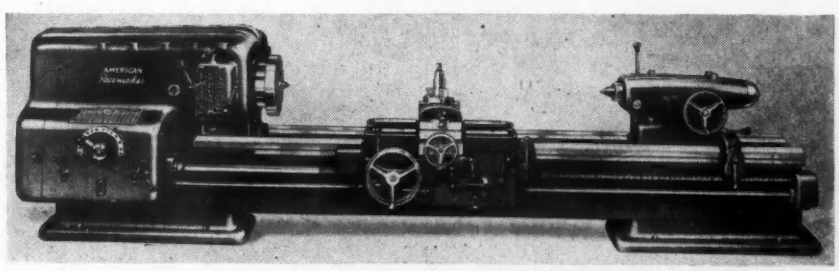
The American Tool Works Co., Pearl St. at Eggleston Ave., Cincinnati 2, Ohio. A new 25-in. Pacemaker lathe. Three types of heads are provided with this lathe; a 27 speed head, and 18 speed head—both for constant speed motor drive—and a nine speed head for two to one adjustable-speed, d-c motor drive. These heads have speed ranges as follows: six to 600 rpm for the 27 speed head, seven to 600 rpm for the 18 speed unit, and six to 750 rpm for the nine speed head with the two-to-one motor.

A change has been made in the spindle control on this lathe. In order to attain extreme ease of manipulation with the finger tip control, the conventional multiple-disc starting clutch and brake unit has been abandoned and replaced with an electrical control. This control provides push button start, stop and brake from the apron and a jog button on the head to facilitate speed changing. Also, when a-c equipment is furnished, a full magnetic reversing mill-type control is used, which provides reverses from the apron.

The quick change gear mechanism is a totally enclosed unit securely attached to the front of bed. It is completely anti-friction in design, automatically pump oiled, with all hardened steel gears and shafts. It provides a range of 60 threads and feeds, from ½ to 30 threads per in. and feeds from 0.004 to .240 in. per revolution.

The apron is of one-piece, box-type construction, anti-friction, automatically pump oiled, with hardened steel transmission and longitudinal and cross feed clutches providing finger tip control.

The bed is of patented four-vee type, providing a generous bearing area for the carriage and two wide area vee guides for the tailstock. Between the girths this bed is tied together with an angular cross section which forms a chute for chip disposal at the rear.



*American Tool Works 25-in. Pacemaker lathe*

NEW
MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

## E-108—Double Housing Planer

Liberty Planers, Inc., Hamilton, Ohio. Electrically controlled planer for heavy-duty operations. The design of this planer is characterized by the built-in electrical operation and controls throughout. The table is driven by means of a variable voltage drive at speeds up to 300 fpm. Rail and side heads are independent units, each with its own electric motor. A push button pendant station provides a central control point for all movements of the rail head and tool slides as well as for automatic "star-stop," "inching," "cut" and "return." A motorized pump provides force-feed lubrication, maintaining the same pressure at all times. Feed and rapid traverse of the heads are performed through a friction safety device for preventing any machine damage by colliding heads.

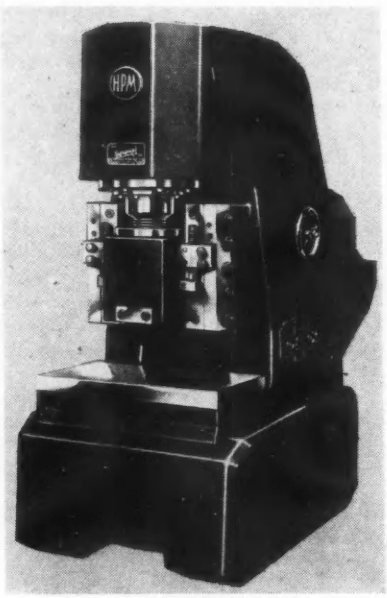
All heads have power feed and rapid traverse in all directions, and parallelism of side heads and rail heads for cutting simultaneously with all tools on the same plane, minimizing the length of the stroke required. This is true because all heads finish the cut at the same time. The tool is set in front of the bull gear to pull in instead of push the cut in the tools.

The rail heads of the machine are all set toward the center, providing the minimum distance from the tool when cuts are required close together. The side heads are all set toward the top to provide close range for the tool underneath the cross rail. Dual control levers are provided on right and left hand side of the machine. Precision tool point levers are provided for the rail head.

## E-109—High-Speed Hydraulic Press

The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio. The H-P-M Economy press, a 50-ton hydraulic open-back inclinable press capable of cycling up to 100 times per min. Pressure is applied by a direct-acting hydraulic ram, incorporating booster rams for rapid traverse. The press closes at 984 ipm, works at high pressure at 84 ipm, and opens at 790 ipm.

Ram action provides straight motion without side thrust, and ram speed is adjustable, though constant throughout the working stroke at whatever setting is selected.




*H-P-M Economy press*

Power is supplied by a 7½ hp, 1800 rpm motor direct connected to a radial pump. Pressure output of the pump is adjustable from 15 tons to 50 tons, providing 16 in. daylight opening. Working stroke is four in., one in. at maximum pressure, with the press reversing automatically when the predetermined pressure is reached. A pressure gage provided visual condition of pressure settings and conditions.

The machine is equipped with hydraulic tilting control, and can be tilted to angles of 10, 20, or 30 deg.

A semi-automatic or full automatic cycle can be selected at the control station, with a pneumatic control circuit for smooth operation. Interlocking safety features make repeating impossible when the machine is set for semi-automatic operations. These operating controls provide instantaneous cycle start and precision inching, as well.

## E-110—Worm Gear Hobbing Machine

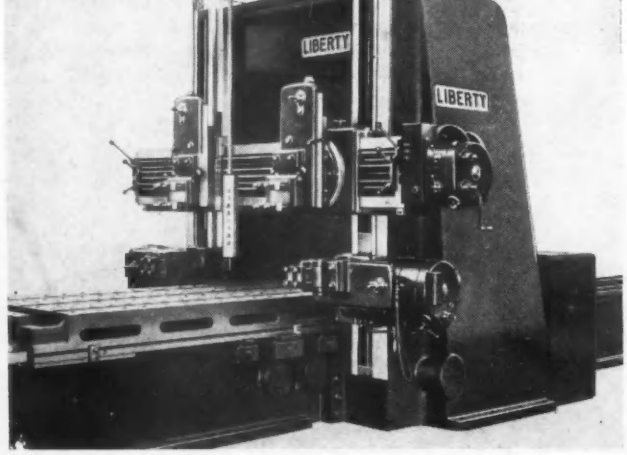
Gould and Eberhardt, Inc., Irvington 11, N. J. Worm gear hobbing machines for the production of single and multiple-thread worm gears with hobs or fly cutters. These machines are arranged with both automatic infeed and tangential feed. A diversified range of worm gears of ratios from 1 to 1½ up to 1 to 100 and greater can be produced.

Worm gears to be hobbed are supported on a work-table fixed in a large tapered bearing fitted directly within the main base. Special adjustment means are provided to maintain the diameter and end fits of the work spindle. The low stanchion carrying the hob slide is movable horizontally along the base of the machine to establish the proper center distance for the varying worm and worm-gear diameters.

Final drive to the work-table is by dual-lead worm gearing in which the worm is arranged with a different lead on each set of profiles, thereby producing a thread that varies in thickness from one end of the worm to the other. By axially adjusting this dual-lead worm the backlash is controlled without disturbing the center distance or affecting the transmission of uniform motion.

The tangential feeding head is adjustable vertically on the stanchion to permit setting the hob axis exactly in relation with the center of the worm-gear face to be cut. The tangential head also may be adjusted angularly five deg above and below its horizontal axis to compensate for the change in the hob diameters and lead angles that result from sharpening the hob. Tangential feed to the hob is available in either direction.

The hob spindle incorporates a departure from conventional designs in that a tapered bronze sleeve is shrunk on the heat-treated spindle to rotate within a stationary hardened bushing. This spindle is arranged with two in-



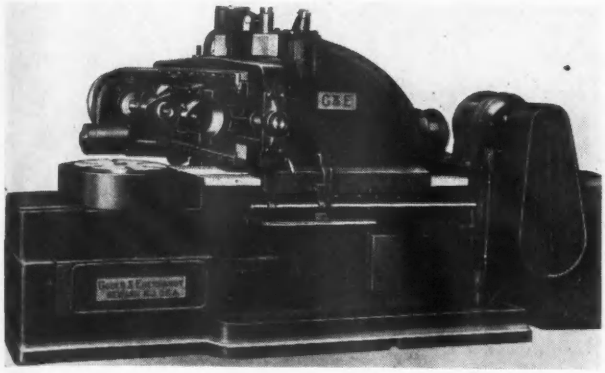

*Liberty 60-in. electrically-controlled double-housing planer with side heads for heavy-duty operations*

dependently adjustable means to maintain the diameter and end fits. Final drive to the hob spindle also is of the dual-lead type worm and gear with facilities to adjust for backlash.

A dividing plate is located at the multiple-splined end of the hob spindle for indexing multiple-threaded hobs. A resetting device is incorporated for positioning the hob axially in proper registration with worm gears that are to be finished after having been roughed out on another machine or with a different set-up.

A quick-change feed case provides a selection of 32 feed changes for both tangential and infeed, arranged in two series and covering a wide range. Both tangential and infeeds may be changed while the machine is in operation.

These machines are provided with direct-connected motor drive with push button controls for starting, stopping and jogging without a clutch. A separate motor controls the power rapid traverse to both the stanchion and hob slide. A fractional-horsepower motor drives the coolant pump.



*Gould and Eberhardt model 30TWG worm gear hobbing machine.*

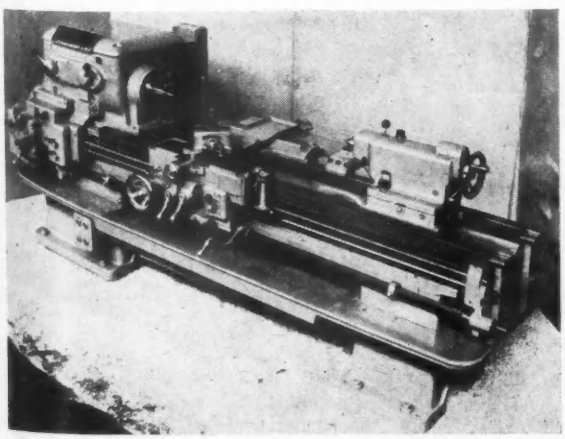
## E-111—Thread and Form-Milling Machine

The Hall-Planetary Co., Fox St. and Abbotsford Ave., Philadelphia 29, Pa. The Hall Planetary for high-production thread and form milling. The manufacturer states that this machine can be used for diversified jobs, ranging from threading spark plugs with production of eight threads per min on an automatic machine, to threading or circular form milling diameters of 13 in. by seven in. long in one hour on a semi-automatic machine. Also, it is stated that the machine is adaptable for larger work.

A feature of the Planetary is that a combination of internal and external threads can be milled simultaneously. The threads can be different pitch and different hand, or a combination of a thread and circular forms can be milled simultaneously.

The work does not revolve or move when milled. All work is held in specially designed chucks or holding devices, which are either mounted on the head of the machine or mounted on a carriage which is tied into the head of the machine.

## E-112—Selective-Head Engine Lathe



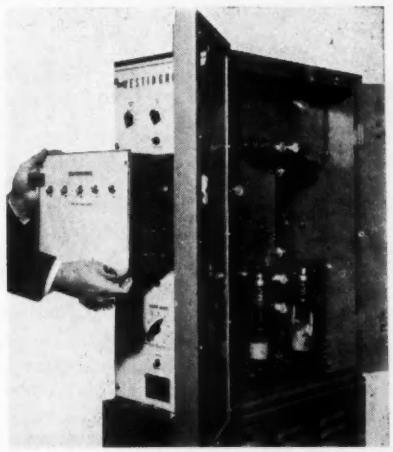
*Lodge and Shipley Machine Tool Co., 3055 Colerain Ave., Cincinnati 25, Ohio. Model X, 16 in. by 54-in. centers selective-head engine lathe. This lathe, one of the new additions to the model X line of engine, toolmaker's and manufacturing lathes, features a 24-speed headstock, a new bed and carriage ways, a totally enclosed quick-change gear box with finger-tip dial operation, and automatic lubrication*

## E-113—Packaged Welding Control

Westinghouse Electric Corp., Pittsburgh 30, Pa. A complete line of nonsynchronous packaged a-c resistance welding controls, known as Weld-O-Timer, make it possible to effect hundreds of combinations for sequencing and timing from only four factory wired subassemblies and two supplementary subassemblies.

Made in two frame sizes, the 1200 and the 600, these new Weld-O-Timers are delivered in a unified, factory assembled package. They can be side-mounted to the welder; or, they can be floor mounted next to the welder; or, they can be mounted at any convenient place away from the welder with adjustment controls at the welder. Regardless of how installed, the replacement of a subassembly is a simple matter; loosen two nuts, disconnect the plug connectors, lift out.

The convenient finger tip control speeds production as each job can be quickly set. Voltage regulator tubes are incorporated in timing circuits to give more accurate timing when connected to welder supply circuits. A transparent access door in the 1200 frame size and a metal access door in the 600 frame size protects the control setting against unauthorized tampering. Inspection of subassemblies is simplified in both models through a front access door and in the 1200 frame sizes a swing-out feature provides access to rear of panel while in the 600 frame size this is accomplished by tilting the sub-unit panel forward. Maintenance is reduced by ready accessibility to all parts, by factory asembled sub-units, and simplified circuits which mean fewer parts.



*Westinghouse Weld-O-Timer*

## E-114—Planetary Gear Shaper

The Fellows Gear Shaper Co., Springfield, Vt., Planetary gear shaper for cutting external spur and helical gears. This machine employs a large gap-type cutter, approximately 16 in. in diam., around which the work moves. The cutter is reciprocated, but does not rotate.

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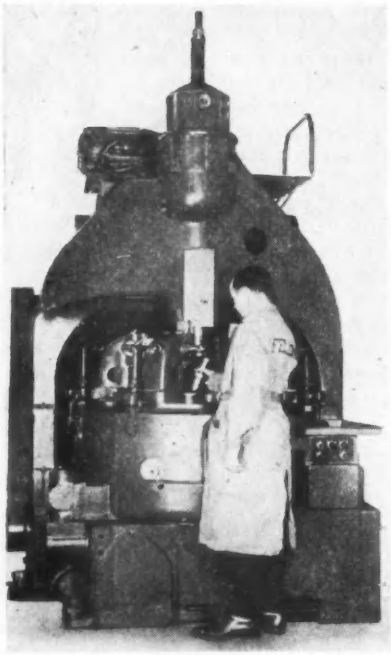
The work is held on individual work-spindles carried in the rotating turret. The work-spindles are driven by individual worms and index wheels that are kept in step with turret rotation. The



***Fellows planetary gear shaper for cutting external spur and helical gears.***

work-spindles, which carry the work-holding outfits are held in aprons, the latter being provided with individual relieving mechanisms which withdraw the work from contact with the cutter when the latter is on the return or non-cutting stroke. Cutting is progressive from roughing to finishing in one operation and in one setting of the work. The cutter is also provided with a large gap to permit insertion and removal of the work. The work-spindles remain at a fixed distance relative to the cutter during cutting stroke.

The machine is provided with complete electrical control, including push buttons for operating the machine once it has been set up, push buttons used when setting up the machine, and a signal light to indicate when the machine has completed the cycle. Production rate, the manufacturer states, is four times as great as can be obtained from a single-spindle gear shaper.

## E-115—Heavy Duty Tapping Machine

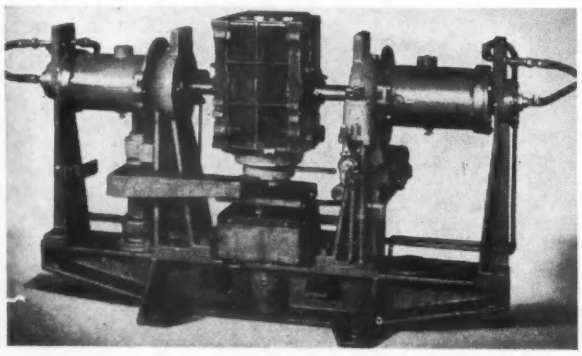
Western Machine Tool Works, Holland, Mich. The Garvin Hi-Power tapper with a heavy-duty capacity for three-in. taps in cast iron. The machine retains the automatic operation feature of the other Garvin tappers. The operating lever is pushed in, the tap enters the pre-drilled hole, taps to required depth, then reverses and backs out to original setting at higher speed.

Spindle rotation is obtained through oppositely rotating friction clutches of different diameter which provide fast backing out of the tap. The clutches are adjustable for wear and torque-transmitting capacity. Torque is supplied by driving pulleys mounted on Timken tapered roller bearings. The spindle takes a heavy-duty, self-centering chuck, either an adjustable type up to 1¼-in. tap shank diam, or non-adjustable collet type. A tripping device actuated from stop nuts on the spindle, which may be locked in any selected position, provides accurate tapping depth.

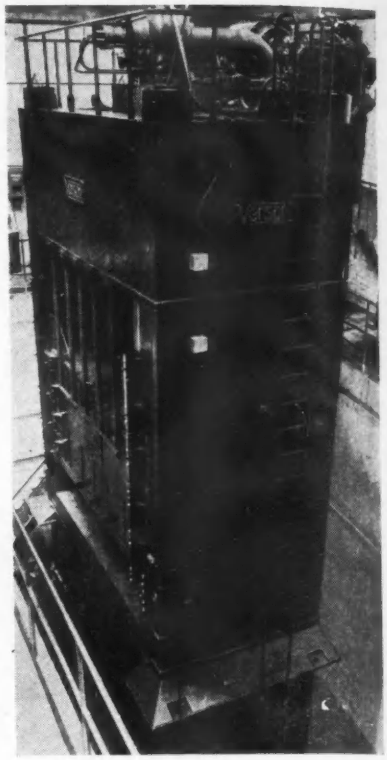
A selective-type speed box provides four standard spindle speeds of 72, 95, 141 and 190 rpm. A self-contained unit, the box has an individual motor on a hinged plate for V-belt adjustment. Five-hp, 1800 rpm motors are supplied as standard, on demand, with starter and pushbutton controls.

The table is actuated by means of telescopic screw and stationary nut. An adjustable positive-displacement pump, driven from the gearbox, delivers coolant and lubricant to the tap. All transmission shafts and the splined spindle are mounted on Timken tapered roller bearings.

## E-116—Cylinder Block Core Machine



***The Tabor Manufacturing Co., 6225 Tacony St., Philadelphia 35, Pa. Foundry core machine for making barrel cores for cylinder blocks in pairs. It features three draw mechanisms—one at the bottom, and two four-in. lateral direction draws. In addition, a roll-over feature is incorporated, as well as a swing out arm for easy delivery of the finished core.***



## E-117—1500-Ton Hydraulic Press

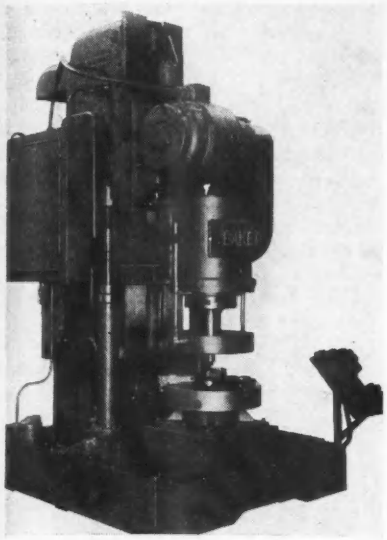
***The Verson Allsteel Press Co., Chicago, Ill. A new 1500-ton straight-side hydraulic press. Standing 38 ft. high, the press measures over 19 ft. in length and 10 ft. in width. The stroke is 48 in. with 88¾ in. of daylight. Bed area is 96 in. by 144 in. Total weight is approximately 500,000 lb.***

***The press features fast advance to the work with automatic shift to full pressure stroke, thereby eliminating high-speed impact. Reversal is automatic on pressure or distance. Full electrical push-button control is provided for automatic operation with control stations for four operators.***

## E-118—Single-Spindle Boring Machine

Baker Brothers, Inc., P. O. Box 101, Station F, Toledo 10, Ohio. Model 60-HO-4 vertical extra heavy-duty single-spindle drilling and boring machine. This machine is said to be particularly adaptable to carbide-tipped cutters. It has hydraulic feed and lower driven spindle through enveloping cone-type worm and worm-gear. Pitch diameter of the worm gear is 16.380 in., and diameter of the spindle in lower head bearings is 6.299 in. A spindle with 12½ in. diameter flanged end for attaching cutter heads direct to the spindle will place the cutters at a minimum distance from spindle bearings. Also, a spindle with standard No. 6 Morse taper can be used.

Flexibility of spindle speed is secured by means of a provision for pick-off gears in combination with a sliding gear in head. This gives two quick

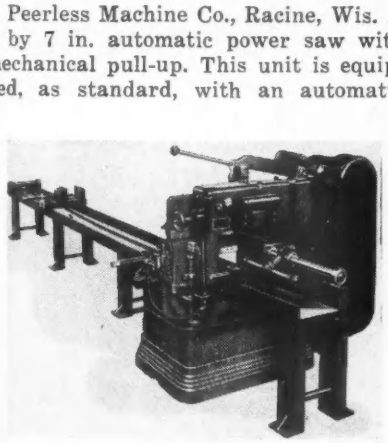


*Baker 60-HO-4 extra heavy-duty hydraulic-feed machine. In the illustration, the machine is arranged with a torque motor operated three-jaw chuck for holding aircraft engine cylinder sleeves, ranging in bore sizes five to 7¼ in. diam.*

changes of speed which, combined with a two-speed constant hp motors, is raised to four speeds. This machine is mounted on a vertical frame, well ribbed with a closed front face, and provided with Baker Twin Pull cylinders.

## E-119—Automatic Power Saw

Peerless Machine Co., Racine, Wis. A 7 by 7 in. automatic power saw with mechanical pull-up. This unit is equipped, as standard, with an automatic

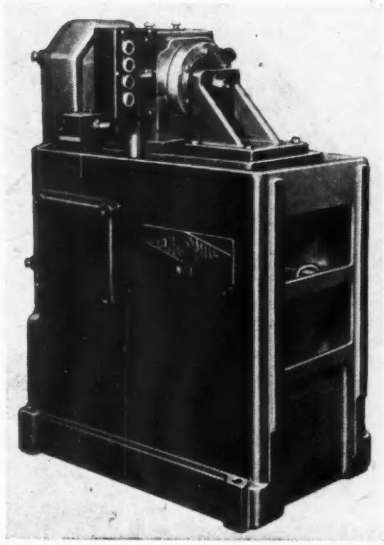


*Peerless 7 by 7 in. automatic power saw*

length gauge for gauging lengths ⅛ to 48 in. Metal is fed forward through a four-sided saw frame which is a feature of the Peerless Mechani-Cut power saw. The frame surrounds the metal to be cut instead of straddling over the work. In order to permit maximum pressure on the saw blade, without shortening blade life unduly, a unique type of backing plate is provided to back up the blade. High capacity and longer blade life are advantages claimed for the new machine.

## E-120—Planetary Milling Machine

Plan-O-Mill Corp., 1511 E. Eight Mile Rd., Hazel Park, Mich. Plan-O-Mill No. 1 planetary milling machine designed especially for low-cost, high-volume thread and form milling. It features push-button operation, coordination of feeds and speeds, simplicity of set-up and Thy-mo-trol electronic control of feed-in and feed-around. The manufacturer states that a complete part can be milled with this machine in one operation requiring as little as eight seconds. It is also claimed that, since the part itself does not move, (the revolving cutter being fed around the work), large parts may be handled with ease and speed. The machine has

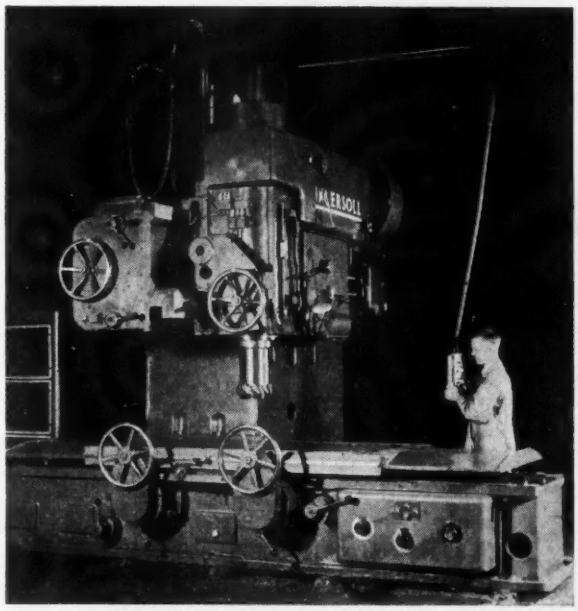


*Plan-O-Mill No. 1 milling machine*

facilities for either external or internal threading; and it threads and mills parts up to two in. ID or OD, or larger with offset head. It is operated by means of an electronic control panel.

## E-121—Vertical Spindle Milling Machine

***The Ingersoll Milling Machine Co., Rockford, Ill. A vertical spindle milling machine for milling in cast iron, steel forging billets, and in die-block steel with carbide tipped cutters. The machine design is said to incorporate all the rigidity and power necessary to utilize the latest developments in milling cutters. It weighs 40 tons and stands 12.5 ft high.***

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## E-122—Notching Press

The V and O Press Co., Hudson, N. Y. The No. 410 notching press for notching electrical motor laminations. This machine can be adapted to notch rotors, stators and segments at speeds up to 800 strokes per minute. The press body is of the pedestal type with the bed cast integral to the body, and provided with a long slide, eccentric-type shaft, overhanging bronze-bushed journal bearings, and a bronze pitman unit.

The clutch is an instantaneous-engaging, self-energizing, cone-type friction clutch, operating in conjunction with the fully releasable brake on the press shaft. In tripping the press, the brake is released allowing the clutch to engage. The brake is held open automatically until the completion of the notching cycle at which time the brake is mechanically engaged, and at the same time disengages the clutch, bringing the press to a stop after notching the last notch of lamination. The brake controls are timed by a solenoid which is electrically controlled by a micro-switch on the index fixture.

Lubrication of the No. 410 is by automatic force feed consisting of an oil-reservoir and pump unit which forces oil through a branched tubing line to all of the principal bearings of the machine. The fixture is not lubricated automatically.

The index fixture is of the friction-

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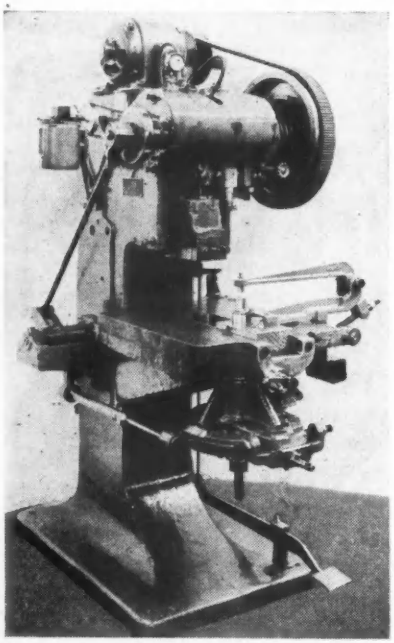
driven, positive-locking type. A friction band, lined with leather, driven by a crank and connections, grips the fixture and moves it forward. As the motion is reversed, a locking pawl drops



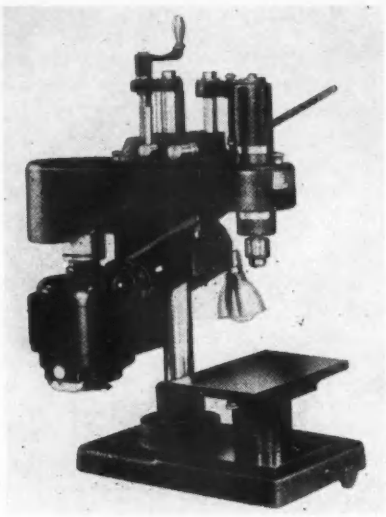
*V and O No. 410 notching press fitted with external fixture*

into position and holds the fixture stationary under pressure during the lower part of the stroke of the machine, while the punch and die are working. No driving pawl is used.

This press has a capacity of five tons and a stroke of one in. Throat depth from center of slide to back is nine in.; and throat height from bed to ways is 10 in. The weight of the press is 1600 lb.

### E-123—Variable Speed Drilling Machine

The Hamilton Tool Co., Hamilton, Ohio. The Hamilton Varimatic variable-speed drilling machine for production drilling of small holes in all drillable materials. Speed adjustment is indefinitely variable in two speed ranges from 840 rpm to 9300 rpm. These two speed ranges are obtained by two-step drive and spindle pulleys; and spindle speed may be changed from one range to the other by an adjustment of the belt. Within each of the two speed ranges, the speed of the spindle is infinitely variable by setting the graduated hand-wheel speed dial to



*Hamilton Varimatic drilling machine*

exactly the speed wanted.

The manufacturer reports that the drilling unit itself contained, swings radially on the column and locks to any position. All controls are manually operated. A 6½ in. vertical adjustment of the drilling unit is accomplished by means of an elevating screw. Operator is protected by safety shields which cover all moving parts. Size overall is 24 in. deep, 29 in. high, 10⅝ in. wide. Net weight is approximately 165 lb.

### E-124—Automatic Cycle Milling Machines

Kearney and Trecker Corp., Milwaukee 14, Wis. A new line of 32 knee-type milling machines featuring automatic table cycle control. Designed and built in plain and verticle styles, these models are said to combine the advantage of both knee-type and production-type milling machines. They are available in power sizes from three to 50 hp, with either manual or automatic cycle operation. Other features include: predetermined cycle time making uniform hourly production possible; quick change speeds and feeds; six-way power rapid traverse—with spindle stopped or running; single lever directional control for engaging table feed or rapid traverse; pull-out plunger automatically controlling table reversal movement from rapid traverse reversal to feed reversal; rapid-set micrometer dials for manual adjustment; positive table screw feed with adjustable nut backlash eliminator; and single shot, metered lubrication for table and saddle ways, drawn from separate saddle reservoir.

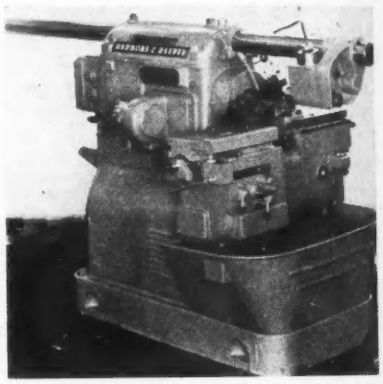
These machines are intended to increase the capacity for production on long run, small run or single piece lot.

For adaptability in milling various metals and in using all types of cutting tools, four standard feed and six standard speed ranges are available.

*Kearney and Trecker model 20 CSM automatic cycle milling machine*

### E-125—Hydraelectric Cutting-off Machine

Bardons & Oliver, Inc., Cleveland 13, Ohio. Three sizes of cutting-off machines with automatically-operated,



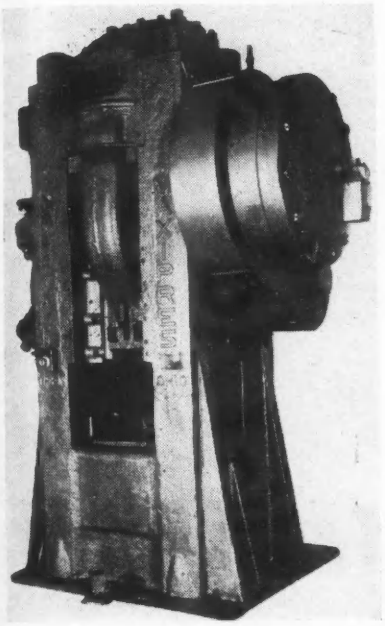
*Bardons and Oliver No. 33 Hydraelectric cutting-off machine*

double tool slides for cutting, chamfering, facing and other operations on round bars, tubing and pipe. These machines are complete with coolant base, pump and piping, and are ar-

ranged for motor drive with standard equipment. The No. 33 has a capacity of three in., the No. 34 of four in. and the No. 35 of 5½ in. through the collet chuck. One or more parts can be produced per cycle from tubing or pipe.

## E-126—High-Speed Forging Press

The National Machinery Co., Tiffin, Ohio. No. 1½ high-speed forging Maxipres. The manufacturer states that this press can produce, in one



*National No. 1½ high-speed forging Maxipres*

blow in each die impression, the size of work regularly handled on a 500-lb steam or 1000-lb board-drop hammer. It operates at 115 strokes per minute. Regular equipment includes air-cooled friction clutch, friction-slip flywheel, centralized oiling system, and arrangement for multiple V-belt motor drive. Height above floor is 124 in.; and it occupies a floor space of 62 in. by 77 in. Net weight is 33,000 lb.

## E-127—Five-Way Drilling Machine

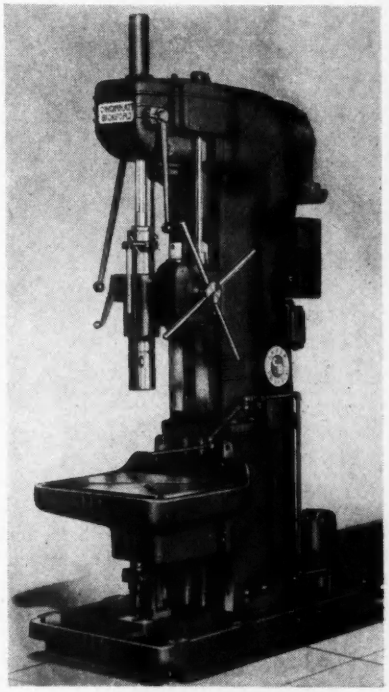
LeMaire Tool & Manufacturing Co., Dearborn, Mich. A five-way machine to drill and counterbore flywheel housings, consisting of a rigidly fabricated center base and three end bases for mounting two No. 5000 and two No. 2000 LeMaire Twin Ram self-contained hydraulic drill units. A straddle type column is provided to mount a No. 2000 Twin Ram unit in an angular position. Openings are provided in the column for the removal of the drill head of the right hand unit. The part is loaded over two plugs that fit into reamed holes in the locating face. An air-operated toggle clamps the part against the locating face. All units operate simultaneously except the front unit which is energized automatically as the other units return, eliminating tool interference. Production is about 46 pieces per hr.

The cycle-operating control box has buttons for cycle start, stop, start and emergency return, all plainly marked. All troublesome chip pockets have been removed; extra large chip troughs are provided in the base. All locators subject to wear are easily replaced. Helical gears are used in all drill heads and standard units.

## E-128—Direct Drive Upright Drill

The Cincinnati Bickford Tool Co., Cincinnati 9, Ohio. Direct drive upright drills built in 21, 24 and 28 in. sizes. This type machine has a moveable head which is securely bolted to the column in any one of three positions. Similarly, a position type table is supplied as standard. The table support is special and is needed only if unusually heavy work is to be encountered. The position type table can be removed, when fixtures bolted directly to the face of the column, or located on the finished pads of the base, are found to be more convenient. Also, for handling large work, the machine can be ordered without table, and if desired, with a finished planed and T-slotted base working surface.

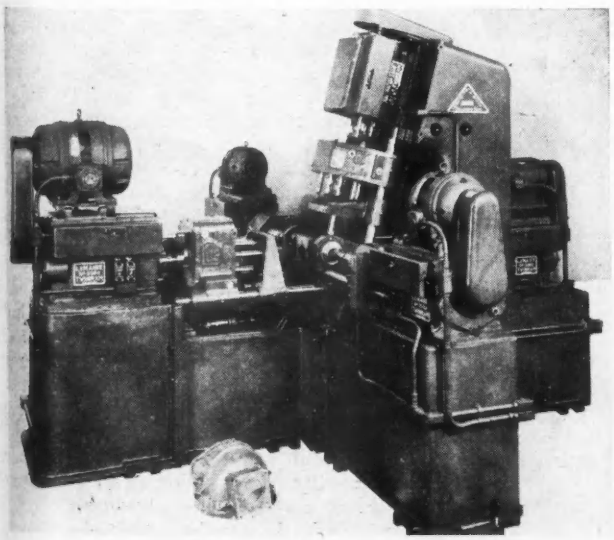
When frequent table height changes are anticipated, the table can be of the adjustable type with a screw support adjusted by a hand crank.



*Cincinnati Bickford direct drive production drill*

Forward and reverse rotation, and stopping of the spindle are manually controlled by the lever on the left side of the machine. It actuates built-in switches which cause the motor to run in either forward or reverse direction.

Usually, when tapping, the advance of the spindle is governed only by the lead of the tap, but for jobs that require it, power feed corresponding to a particular tap lead can be supplied on any power feed machine. These geared leads are obtainable by the purchase of two gears for each tap lead desired.



*LeMaire five-way drill and counterbore machine*

## E-129—Cam Feed Drilling Unit

Avey Drilling Machine Co., Cincinnati 1, Ohio. A drilling unit with a hydraulic feed, mechanically and electrically controlled spindle, for specialized applications of sensitive drilling, particularly for drilling deep holes of

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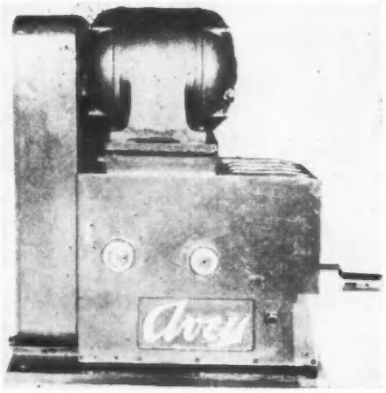
small diameter. Incorporated in this unit are rapid advance, feed, and return, and automatic withdrawal of drill for chip clearance.

Torsion applied to the spindle drive

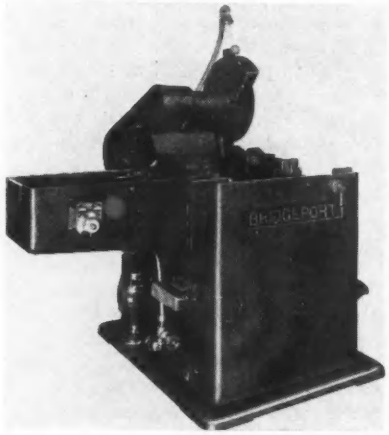


*Avey drilling unit*

sleeve through cams from a driven pulley is directly controlled through spring pressure on a cam plate. The switch is actuated from the cam plate and operates within 0.005 in. Movement of the cam plate can be controlled as to the amount of torsional load applied to the drive, to control drill withdrawal, by an adjustable spring. The switch in turn operates a solenoid through a relay to withdraw drill. Facing operations may be done with an electric timer and positive stop. A gap feeding attachment is available.

## E-130—Automatic Cut-Off Machine

The Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn. No. 51 automatic cut-off machine, hydraulic in operation, which will handle stock

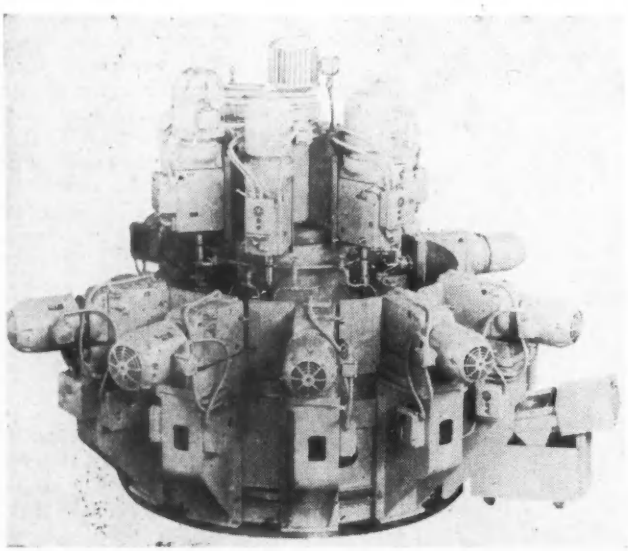


*Bridgeport No. 51 automatic cut-off machine*

up to two in. in diam and will automatically cut off the stock in lengths up to 12 ft.

The cut-off head consists of a 16 in. diam cut-off wheel which is driven by a 10 hp motor through a V-belt drive. The head is mounted on a rocker shaft with Timkin bearings which are fully sealed against grit. Coolant is supplied to both sides of the wheel through a nozzle which is complete with baffle plates. This nozzle is adjustable to compensate for wheel wear.

The operating cycle of the machine is completely automatic. After the work is loaded into the machine, the operator trips a pilot valve and the work is automatically fed the required distance in the cutting position, gripped hydraulically and cut off. This sequence is repeated automatically until stopped. Two adjusting valves are mounted on the front of the machine for regulating both the rate of stock feed and also the cutting cycle.



*Kingsbury automatic indexing machine*

## E-131—Abrasive Belt Grinder

Porter-Cable Machine Co., Syracuse 8, N. Y. A belt grinder for grinding and polishing contours. In the Porter-Cable C-6 a flexed abrasive belt approaches and leaves a formed contact roll at a slight angle. The contact roll serves only as a back-up for the abrasive belt. The abrasive belt drapes itself into the pattern on the roll and grinds or polishes the pattern sharply. Forming the contact roll is done while the roll is mounted in the machine. The shape is turned into the roll which can be worked as easily as wood. This

*Porter-Cable C-6 belt grinder*

contact roll is made of sisal and latex and holds a pattern indefinitely, yet is slightly resilient.

The C-6 takes up a floor space 26 in. by 38 in. The overall height is 73.5 in.

## E-132—Automatic Indexing Machine

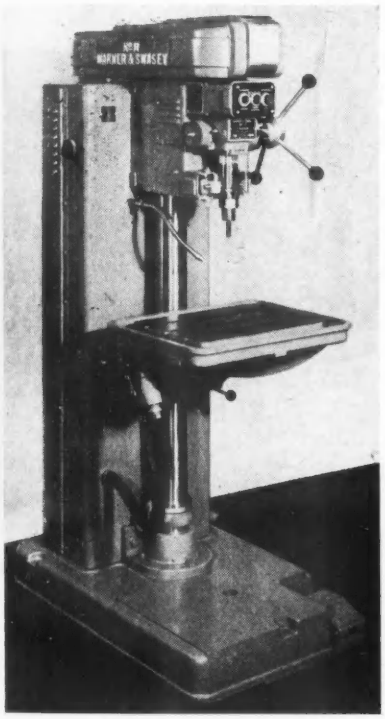
Kingsbury Machine Tool Corp., Keene, N. H. Automatic indexing machine for 12 operations on three faces of the work. It has 12 automatic units and a 60-in. automatic index table with 12 chucks. Whenever the table indexes, every chuck rotates 180 deg. In that way, four of the horizontal units can operate on one face of the work and the other four horizontal units on the opposite face. Four vertical units on a central column work on the third face. The chucks rotate in a harmonic motion, so that they start and stop slowly. The plates that carry tool guide bushings pilot onto the fixture to locate the operations to the closest tolerances. The work holding chucks are of the two-jaw self-centering type. A small compressed air motor near the operator rotates a screw on the chucks to open and close them quickly.

Control is all electric. The operators pilot switches are on a 110-volt circuit, and all control switches are in a separate dustproof cabinet away

from the machine. These controls make it possible to index the table and lock it accurately or else jog it part way for setting up and changing tools. The indexing can either be completely automatic or under the control of the operator.

## E-133—Tapping and Threading Machine

The Warner and Swasey Co., 5701 Carnegie Ave., Cleveland, Ohio. A precision tapping and threading machine, newly redesigned to increase accessibility of controls and to provide greater safety and ease of operation. Heavy duty electric controls and an improved circuit increase reliability and production.



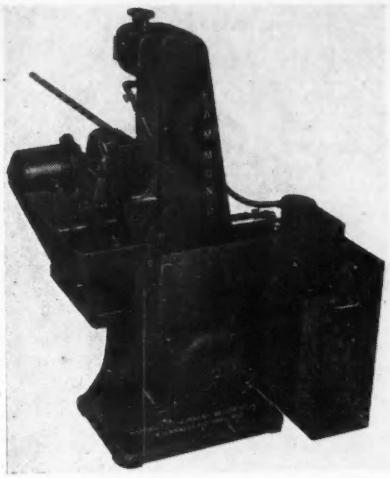
*Warner and Swasey No. 11 precision tapping and threading machine.*

Solenoid operated guide figures mesh in a master lead screw. The thread accuracy ground into the tap or die is exactly reproduced in the work piece. A safety clutch stops the tap if it strikes chips in a blind hole. Automatic reversal provides for backing out at predetermined depths. The feature of this machine is its universal adaptability to quick action with special work-holding and indexing fixtures which can be provided to actuate the electric controls. Threading capacity 8-36 to 0.875 in. diam.

## E-134—Wet-or-Dry Grinder-Polisher

The Hammond Machinery Builders, Inc., Kalamazoo, Mich. The OD-1 cylindrical grinder-polisher for rods, bars and tubes from ⅛ in. to 1¼ in. diameter.

The OD-1 is a centerless machine using coated abrasive belts for grinding and polishing. For stock removal it will remove up to .005 in. per pass on ferrous metals and up to .010 in. on non-ferrous. Work supports will handle ½ in. bars up to 18 ft long and 1 in. bars up to 8 ft long. Accuracy .001 in. on production items — closer limits on some work.



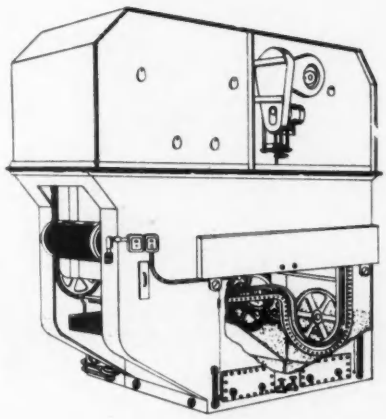
*Hammond OD-1 grinder-polisher*

The endless abrasive belt is 4 in. wide, 60 in. long, and may be operated dry or wet with coolant. Wet operation is recommended by the manufacturer as it gives better finish, does not discolor work from heat, and gives higher production and longer belt life.

## E-135—Vapor Degreaser

Detrex Corp., 14331 Woodrow Wilson, Detroit 32, Mich. A new standard conveyorized one-dip concentrator, the 1 DC-750. This vapor degreaser is designed to degrease small miscellaneous screw machine parts. It is particularly suited to small shops since the machine occupies less than 75 sq ft of floor space and measures only 9.75 ft in height.

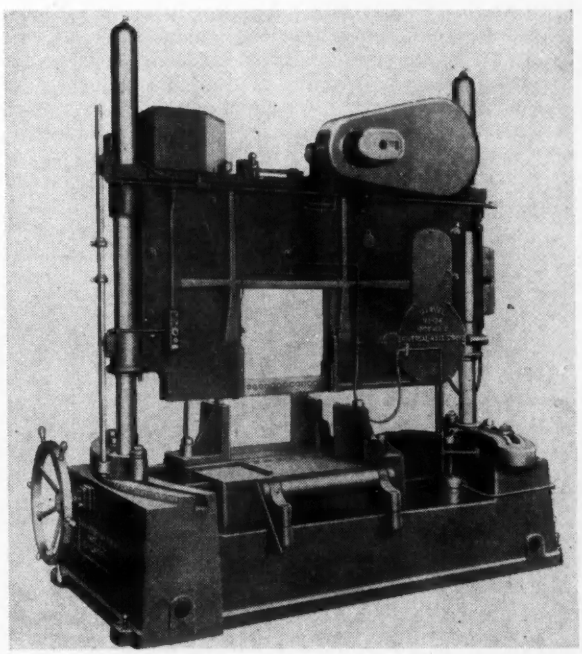
The unit may be suppplied with rotary or a combination of rotary and flat baskets. Rotary baskets are 10 in. diameter by 20 in. long. Work to be cleaned is loaded at one end of the degreaser, carried through the cleaning cycle, and is returned through the upper hood to the same end of the machine for unloading. The conveyor system is complete with sprockets, shafts, take-up device, speed reducer and variable speed drive. All of the sprockets below the vapor line are zinc coated, as are all crossrods and conveyor chains.



*The 1 DC-750 Detrex degreaser.*

## E-136—Hack Saw Machine

***Armstrong-Blum Manufacturing Co., 5700-5800 W. Bloomingdale Ave., Chicago 39, Ill. No. 24 Marvel hack saw machine. Claimed to be the world's largest reciprocating hack saw machine, this huge cutter weighs 16,000 lb, has a 24 in. by 24 in. capacity, and uses a non-breakable hack saw blade 36 in. long by 4½ in. wide by ⅛ in. thick***





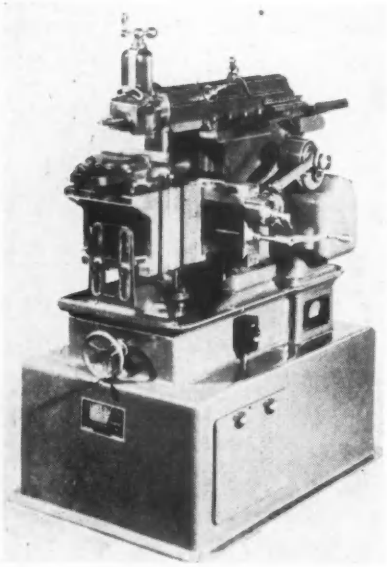
*For additional information regarding any of these items, please use coupon on page 120*

# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

## E-137—Versatile Precision Shaper

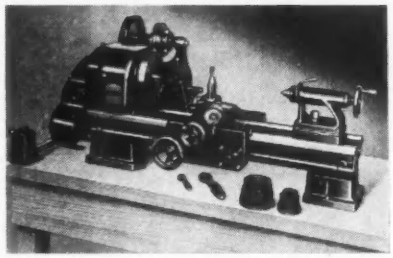
Sheldon Machine Co., Inc., 4258 N. Knox Ave., Chicago 41, Ill. A 12-in. back-geared precision shaper designed to fill the gap between the large, heavy industrial shapers and the small bench-type machine. It has automatic cross feeds in both directions from 0.0025 in. to 0.0175 in., and is equipped with a variable-speed motor enclosed in the pedestal, which provides speeds from 12 to 180 strokes per minute, as controlled by a hand wheel. Swivel table and swivel vise are standard equipment.



***Shaper made by Sheldon Machine Co.***

## E-138—New Nine Inch Lathe

Logan Engineering Co., Chicago 30, Ill. A new 9-in. lathe having the same basic design features that characterize larger lathes of the Logan line. With a 9-in. swing, and 18 ins. between centers. the lathe is built for use in precision manufacturing operations, and general machine shop and tool room work. Like the larger lathes of the Logan line, the new 9-in. lathe has a ball-bearing spindle mounting inherently well adapted to high-speed operation. The two V-ways and two flat ways of the bed are precision ground to within 0.0005-in. of parallelism. Construction insures steadiness on heavy cuts and durability. Self-lubricating bronze bearings are provided vital wear points.



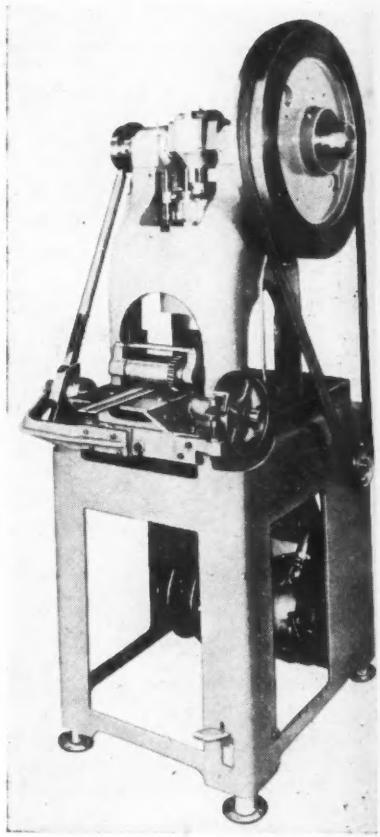
***Logan nine-in. lathe.***

## E-139—Automatic Punch Press

Di Machine Corp., 2711 W. Irving Park Road, Chicago 18, Ill. A 12-ton-high speed press with automatic roll feed and variable speed drive. The new Diebel press accommodates standard die sets measuring to 8½ by 6¼ in., or special die sets measuring to 8 by 12 in. The shut die height over the bolster plate is 6 in. The adjustable automatic roll feed mechanism, which operates by means of an eccentric body on the crankshaft, is an integral part of the machine. Stock to 4½ in. wide may be employed, and the length of feed is adjustable to 6 in. The feeding mechanism provides accurate feeding for the use of progressive dies as well as for the use of blanking or compound dies. The variable speed drive permits operation of the press between 65 and 300 strokes per min.

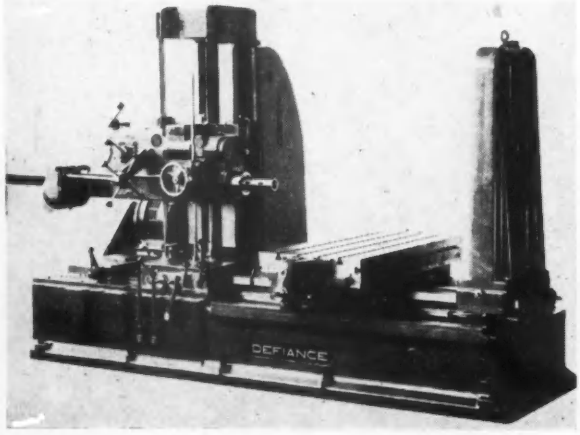
Standard equipment consists of the press complete with clutch for single stroke operation, automatic brake release, hardened and ground feed rollers, knock-out bar in the ram, stock guides, motor, and starter. Power is supplied by a 1½ hp, 1725 rpm, 220 volt, 60 cycle, 3 phase, a-c motor mounted under the bed. The press is available with a 1, 1½ or 2-in. stroke.

The 12-ton Diebel Hi-Speed automatic press occupies a floor space of 32 by 40 in. It has an overall height of 66 in., and weighs approximately 1500 lb.



***Twelve-ton Diebel Hi-Speed automatic punch press.***

## E-140——Horizontal Boring Mill




***Defiance Machine Works, Inc., Defiance, Ohio, No. 25A horizontal boring mill. This machine features centralized controls, outboard bearing supports and two central guiding ways on the bed. The outboard bearing supports are integral with the machine, thus insuring perfect alignment at all times, the manufacturer states.***

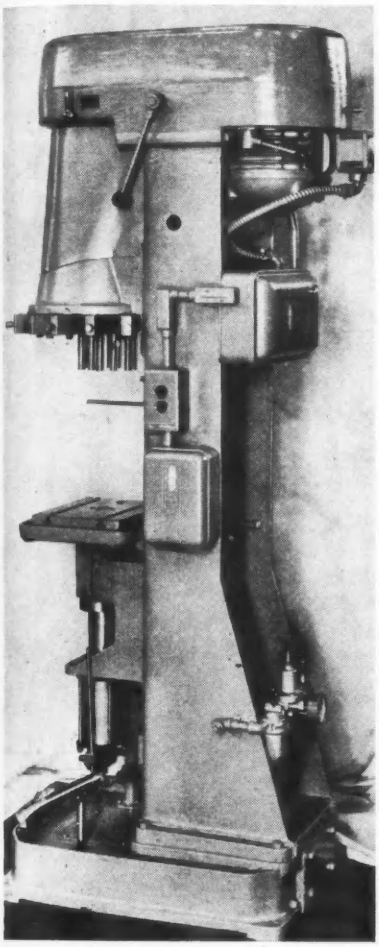
## E-141—High-Speed Multiple Drill

Baush Machine Tool Co., Springfield 7, Mass. A high-speed multiple driller and tapper for small holes and close layouts. The model 46 is new in design, having small-diameter spindles, permitting close centers and allowing smooth high spindle speeds.

These machines are furnished with hydro-pneumatic feed, using an air cylinder from the main line for the pressure. This feed can be adjusted to give feed in both directions, with or without the quick approach and quick return. Motors can be furnished for one-direction rotation for drilling only, or reversing with limit switch for both drilling and tapping. Machines are arranged for Texrope drive with single

belt on four-step cone pulley. Belt is changed by hand, using two convenient levers for loosening, tightening and locking.

The table is provided with adjustment for setting at various heights, to suit work and feed stroke. Feed stroke



*Baush model 46 driller and tapper*

may be adjusted to use part or all of stroke, also par or all of either rapid approach, feed or return. The hydropneumatic stroke is controlled by setting knurled adjustable nuts for rapid motion or feed in both directions. All or part of stroke can be utilized. Rate of feed is varied by a knurled knob at front of machine.

Spindles are adjustable type, with flexible drive between pinions in head and adjustable arms. Arms are slotted for positioning any place in the opening of head and clamped by tee bolts. Control of spindle rotation is by start-and-stop push button to motor. Control of feed is by one foot pedal. The foot pedal, when pressed, actuates the feed cycle of the table, which continues to function as long as the pedal is down. Releasing the foot pedal returns the table at the end of drilling stroke at any time during the cycle.

Tapping is performed by reversing the limit switch on the side of the column. The limit switch has an adjustment which can be set for reversing the motor at various desired depths.

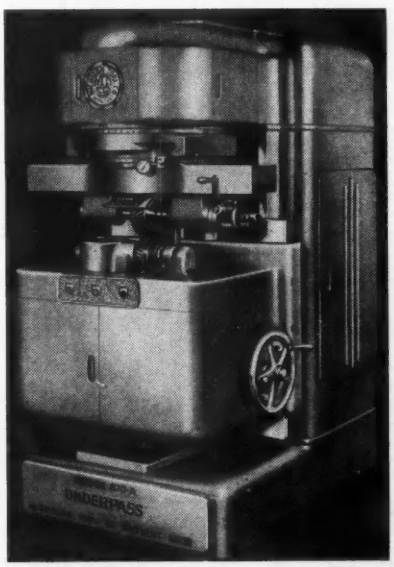
## E-142—New Line of Gear Finishers

Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. A new line of high-production, crossed-axis, rotary gear finishers consisting of two models, the 870 and 870-A, in three sizes each, handling gears up to 8, 12 and 18 in., respectively. Minimum diameter is one in. in all cases, with maximum face width of five in. on standard centers. Maximum distance between cutters is 26½ in., and the machines will take cutters up to 10 in. in diameter.

The model 870-A permits selection at will of any one of three different methods of gear finishing. The three methods are: Underpass shaving, in which the work moves tangential to the cutter; transverse shaving, in which the work is reciprocated axially, while feed is radial; and traverpass shaving, a new development representing a combination of underpass and transverse shaving. To select any of the three methods, it is necessary only to rotate the slide for the work carrying head into the proper position.

Features of the new machines include: A quick-acting cam-lock tailstock; location of the work above the cutter; a new type of machine guard with a rotary-action lift cover on antifriction rolls; and motor-driven compact cone-drive geared 30 to 1 speed-reducer in the machine head for the slide movement. Also, the electrical controls panel is located in a sealed compartment at the side of the machine. These control the automatic machine cycle, regardless of finishing method used.

For applications where extremely wide gears or long splines do not have to be provided for on the machine, the new gear finishers are available without the upfeed movement of the knee, and are known as 870 underpass models.



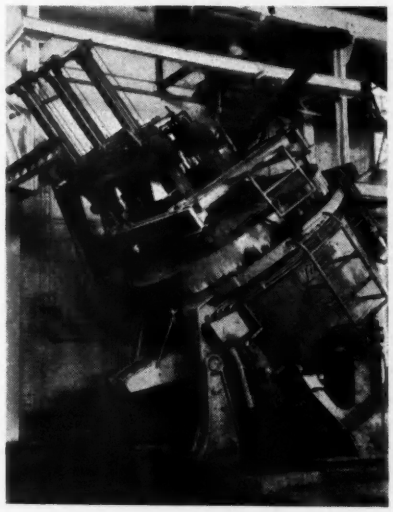
*Michigan Tool model 870-A gear finisher*

## NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

## E-143—Melting Type Electric Furnace

Pittsburgh Lectromelt Furnace Corp., Pittsburgh, Pa. Size PT Lectromelt furnace, a combination melter and duplexing furnace of the top-charge type in which the roof can be raised



*Size PT Lectromelt furnace in pouring position*

and rotated for charging cold scrap. If molten metal additions are to be made, they can be made either through the pouring spout of the furnace or through the working door which is diametrically opposite to the pouring spout. This furnace features oversized roof rings, four-point suspension of the electrodes and power-operated electrode holders. It is of the nose-tilt type to insure minimum spout movement.

## E-144—Hydraulic Drill Unit

Greenlee Bros. & Co., Rockford, Ill. A new compact hydraulic way-type unit for special drilling and boring operations. The manufacturer states that the outstanding feature of this unit is its compactness which permits installation in small space. This was accomplished by designing the ways with an over-all width of seven in., and the use of a new Vickers hydraulic pump and control panel. The unit is driven by a single motor ranging from two to five hp, and can be furnished with strokes from 18 to 30 in., without the use of auxiliary equipment.

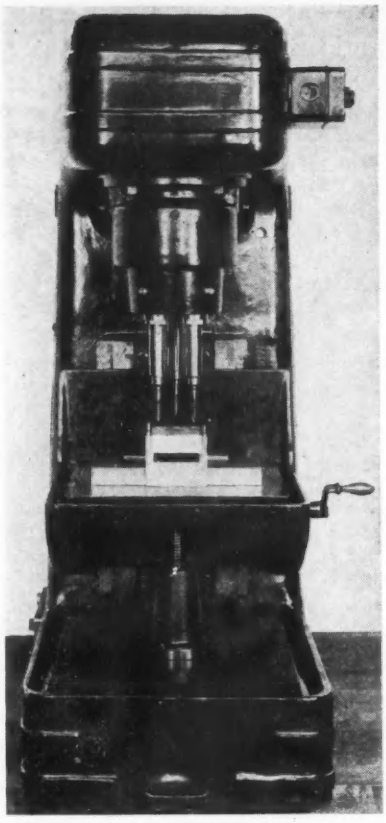
## NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

### E-145—Multi-Spindle Tapping Machine

Motor Tool Manufacturing Co., 7777 Cortland Ave., Detroit 4, Mich. Model A multi-spindle, high-speed tapping machine. Outstanding feature of this machine is the interchangeable head. Head and spindle assemblies are built and sold as a separate unit, each designed and constructed to perform specific tapping operations. These head assemblies can be attached or detached almost as quickly and easily as replacing a tap in the spindle, it is claimed. Any number of spindles may be incorporated in the head—in any pattern—provided they are confined to a 10 by 12 in. area. Center distances between spindles, can be held to one in. Heads are geared so that a uniform flow of power is delivered to each individual spindle and tap. All gears are specifically hardened and operate in a bath of oil. Each spindle is likewise hardened and ground, the thread of which runs in a bronze bushing. Operating speed is optional, in a range from 340 rpm to 950 rpm as standard for each tap. This, however, can be varied either higher or lower, according to requirements, by changing the stepped pulley.

The machine is automatic in operation insofar as tapping is concerned. Work is inserted beneath the spindles by means of a fixture. With the machine set at the proper feed and speed for the work, a foot-pedal starting switch is pressed and the spindles carry the taps down through the work to predetermined depth. At this point the spindles and taps automatically reverse and return to their starting position and stop. The operator can remove the finished work—insert another piece—touch his toe to the starting switch and the whole cycle is repeated again.



***Motor Tool model A, bench-type, multi-spindle, high-speed tapping machine***

The machine has a 16 by 31 in. base, 42½ in. height, and weighs 950 lb with head and spindles, crated.

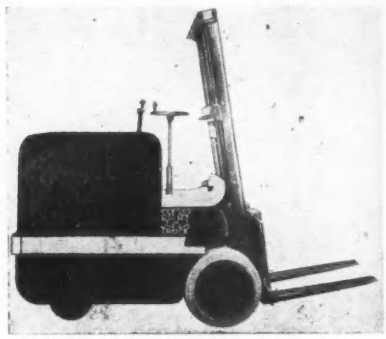
### E-146—Tilting Fork Lift Truck

Wright-Hibbard Industrial Electric Truck Co., Phelps, N. Y. Model 200 center-control, tilting-fork hydraulic-lift truck. This truck has front-wheel drive, rear-wheel steer and hydraulic foot-operated brakes in the front wheels. It has a 2000-lb capacity; is battery powered, and is equipped with a hydraulic lift and tilt system. An independent motor drives the hydraulic pump. The lift fork can be raised to a height of nine ft from the floor.

Safety controls can be operated by the right hand, it is reported. One lever operates the drive motor for three speeds forward and three speeds in reverse by use of a new type magnetic controller. The lift motor operating the hydraulic system is controlled by two levers. All three levers can be operated independently or at the same time. The levers return to neutral position upon removal of hand.

The 18 x 5 drive wheels and the 10 x 5 steering wheels on 36-in. wheelbase run on Timken bearings. The series-wound motor drives a gear type pump to furnish hydraulic power. A total of five-in. road clearance is maintained for breaking over edges of car doors and ramps. A large supply of hydraulic fluid is used to dissipate any heat which might be generated. Two tilt cylinders are used to furnish four deg forward and 10 deg backward tilt.

The magnetic controller for the drive motor is a new design used to cut down arc-over and burning of contact points. The hydraulic valve is a one-piece assembly, which has a centering load spring which returns to off position when hand is removed. A series of micro-switches are employed to give automatic shut-off on several units as additional safety factors. The hydraulic electrical system is completely controlled by micro-switches. The main structure is a welded frame of heavy rolled plate and channel.



***Wright Model 200 lift truck.***

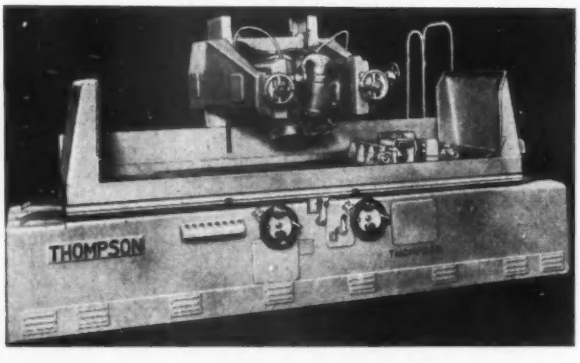
### E-147—Small Hydraulic Press

Laboratory Specialties, Inc., 144 S. Wabash St., Wabash, Ind. Wabash hydraulic laminating press. This is a large-area press for either hand or motor operation, with a total capacity of 50 tons, designed for research work in wood and plastic lamination, for extraction of oils and waxes, for plastic molding or general shop work.

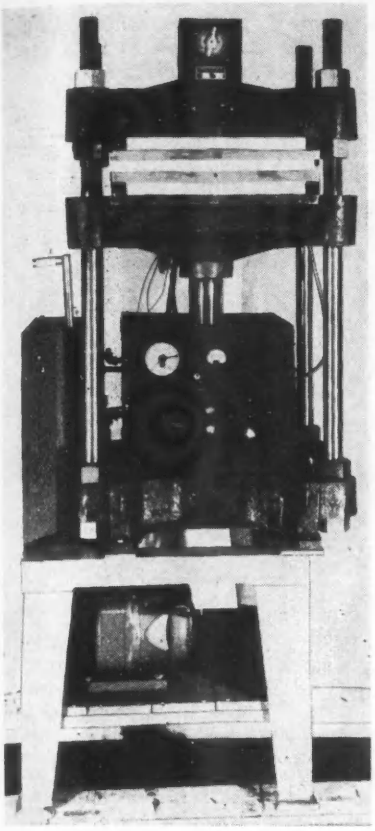
This four-column press has a 6½-in. stroke, with a maximum daylight opening of about 10 in. Platens are of steel, with highly-ground parallel surfaces. Regularly supplied platens have electrical heating elements, and may be had with water cooling.

For power operation, a ½ or ¾ hp motor, driving through a variable speed drive, operates a hydraulic pump, operating at high speed to close to the platens, and at slower speed to apply the pressure required. After desired pressure is obtained, an automatic control maintains this pressure. The press

### E-148—Dovetail Way Grinder




***The Thompson Grinder Co., Springfield, Ohio. A new machine in the Thompson line for the grinding of male and female dovetails. The machine illustrated has a capacity for a male or female dovetail 12 in. wide and 48 in. long, with size control from electric diamond dressing devices.***



*Wabash 50-ton hydraulic press*

has a floor space of 24 by 30 in., and weighs approximately 1450 lb. It may be had in two sizes, one with platens 12 by 15 in., the other with platens 18 by 24 in., and both having capacity of 50 tons.

## E-149—Horizontal Boring Machine

The G. A. Gray Co., Cincinnati 7, Ohio. A new six inch floor type horizontal boring, drilling and milling machine with a 40-hp spindle motor. It has a 60 in. continuous bar travel; 72 in. vertical head travel on the column, 96 in. column travel on runway, and 24 in. column cross travel. This new machine has electronically controlled drives for all feeds, non-metallic ways, for the column base and saddle and automatic power clamping of the column base, saddle, and headstock.

The push button control permits convenient, rapid, accurate, and safe operation of the machine. The controls of the head, column and spindle are centralized on the pendant switch which can be placed in any convenient position. It is perfectly counterbalanced and is carried on a universal support, mounted on ball bearings. The electric cable is never dragged over the floor where it may be injured. The "woodpecker" positioning device readily sets the various units within .00025 in. by simply pressing a micro-jog button on the pendant switch.

The headstock is of extremely sturdy and simple construction. An instospeed change provides 24 speeds in geometric progression for the single heavy duty spindle. Normal speed range for the 5 in. and 6 in. bar is from 4.5 to 900 rpm; for the 7 in. and 8 in. from 2.5 to 500 rpm. Lower speed ranges can be furnished when desired.

The runway has three flat ways and is very wide and deep, and heavily ribbed to rigidly support the saddle. It is provided with closely spaced leveling screws.

The column base is fitted to the saddle having three cross ways perpendicular to the runway. The column may be moved perpendicular to, as well as along the runway, at feed rates or rapid traverse rates. This feature is particularly advantageous for work requiring milling and boring operations in the same setting. It permits bringing the column close to the job for milling and permits moving away from the job for boring so that drilling and boring tools can be inserted. This arrangement also permits endwise adjustment of the milling cutter when it is mounted on the spindle drive sleeve.

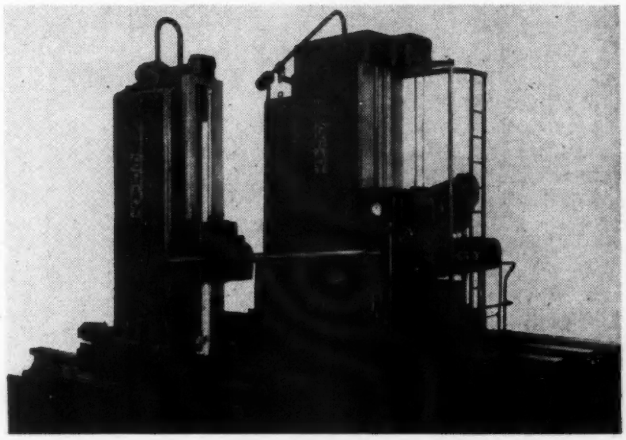
Safety devices and interlocks are provided to protect the machine and the work in the event of faulty operation. Overload protection for the spindle motor insures stoppage of the feed before the spindle motor stops. The feed cannot be operated unless the spindle motor is running.

Vernier scales are regularly provided for column and head stock positioning dial indicators and end measuring standards may be used.

## E-150—Hydroelectric Motorized Lift Truck

Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati 14, Ohio. Model K hydroelectric motorized lift truck. This model is produced in pallet and platform styles in a variety of sizes, all having a 4000 lb capacity with two forward speeds and two reverse, plus dynamic braking. Features include the Steubing two-wheel front drive and an improved dynamic brake controlled by a push button.

Designed for complete electrical operation, a motor and pump comprise



*Gray horizontal boring machine*

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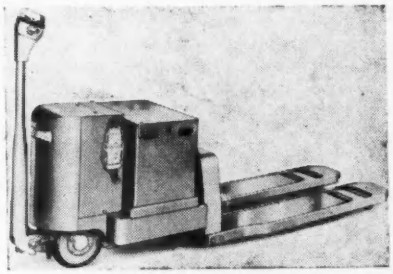
*For additional information regarding any of these items, please use coupon on page 120*



*Model K lift truck*

the power lift. Known as the "Steubing Power Package," motor and control are designed especially for industrial truck service. The entire unit—motor, drive and controller—can be removed from the frame like an outboard motor.

All speeds and the brake are controlled by three push buttons contained in the steering handle. Forward and reverse buttons are two-position, giving low speed when partially depressed and full speed when depressed to the second position. All buttons operate at all times, regardless of the position of the handle.

## E-151—Improved Surface Grinder

The DoAll Co., Des Plains, Ill. Model GH-1 Handraulic surface grinder. The manufacturer has combined the fingertip control of the conventional hand-operated grinder with the automatic power feeds in hydraulically powered machines by means of the Handraulic, a direct coupled hydraulic cylinder to power the table movement.

Starting, stopping, and reversing of the table are controlled by a self-centering, four-way valve. The valve is

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operated by a six-in. hand lever with a ball handle. When the lever is pushed in the desired direction the table starts instantly and moves at a uniform speed.

*DoAll Handraulic surface grinder*

To stop the table, the operator releases the handle which automatically returns to neutral, instantly stopping the table. Through a valve located next to the directional control lever, table speeds infinitely variable from five to 50 fpm are obtained.

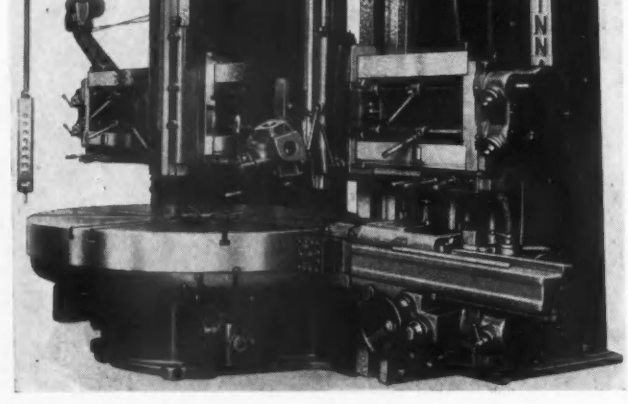
The table is equipped with new-type combination trip dogs to regulate length of table travel. These trip dogs can be set to stop the table either automatically by returning the control lever to neutral or instantly at a predetermined point regardless of the position of the lever.

The manually operated one-in. cross-feed screw is located in the center between the cross ways. It operates in a large bronze nut, and its thrust is taken by double pre-loaded Timken taper bearings. The cross-feed handwheel is graduated in increments of 0.001 in. With the built-in vernier, settings to 0.0001 in. are possible.

## E-152—Vertical Boring and Turning Mill

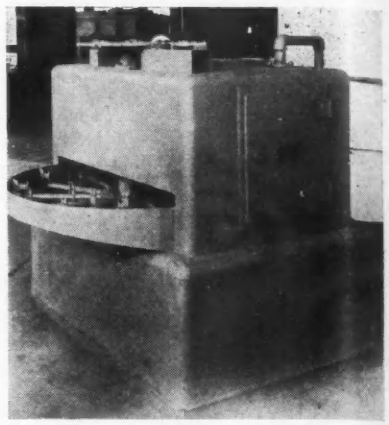
The Cincinnati Planer Co., Cincinnati 9, Ohio. Six-ft vertical boring mill with 50-hp single-shift, variable-voltage drive. This new Hypro machine is equipped with push button control which permits a wide range of speeds, without gear changes, in the high and low speed range. When facing across large diameter work, a constant cutting or facing speed can be maintained regardless of decrease in diameter of work as tool progresses toward the center of the table. In between or compromise speeds are eliminated. Less maintenance is required for machine as several gears, shafts, bearings and other mechanical parts have been eliminated. Operator may read the table rpm direct from pendant station without referring to speed chart or lever positions.

This machine is also equipped with a new type table track in the form of a large anti-friction bearing rather than the usual plain bearing surface. This feature is said to eliminate heating due to friction and, therefore to make higher speeds possible for using carbides on large machines, especially where it is necessary to bore small diameter holes. Elimination of heat in bed and table castings also prevents distortion of machine when running for long periods of time at high speed. This feature also is claimed to eliminate bed and table track scoring.




***Six-ft Cincinnati Hypro vertical boring mill with one right-hand turret head and one left-hand swivel head on the cross rail and one right-hand side head***

## E-153—Cleaning Machine



***The R. C. Mahon Co., Detroit, Mich. Special cleaning machine for cleaning engine parts prior to final assembly. The machine contains a solution tank, steam heated coils, high-pressure jets and a rotary turntable. The steam coils are immersed in the solution, and the jets are placed so that the hot solution is directed on parts carried through the machine on the turntable. This turntable rotates intermittently, its speed being regulated by an indexing control mechanism.***

## E-154—Turret Punch Presses

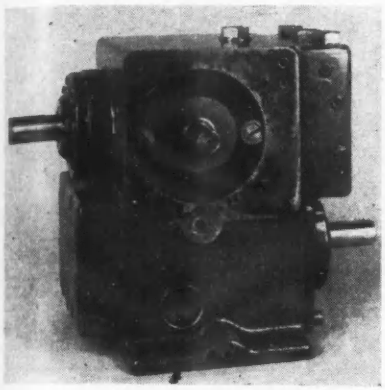
Wiedemann Machine Co., 1815 W. Sedgley Ave., Philadelphia, Pa. The type R-7 turret punch press which will pierce differently shaped holes up to six in. square in sheets up to 60 in. by 120 in. by ¼ in. This press incorporates a gauging arrangement which permits the handling of such size sheets and plates without conventional layout, and in one operation. The table positions the material on both X and Y coordinates by easy-turning hand wheels; dimensions are easily set directly from blueprints or from a chart conveniently located to the operator. The turret is motor operated, and the proper punch and die rotate into punching position in a matter of three to four sec. The type R-7 exerts 160,000 lb pressure, has a 54-in. throat, makes 65 strokes per min, contains 12 to 32 punches and dies, and operates on a five hp motor.

The type R-44, another addition to the Wiedemann line of turret punch presses, was developed for accurate piercing through templates. A unique safety device eliminates the possibility of damaging the template by improperly positioning the punch and tripping the press. This machine handles production runs up to 2500 pieces of a kind with great speed and accuracy. All openings are template pierced in but one handling operation.

## F-46—Small Size Hydraulic Transmission

The Portman Machine Tool Co., 70 Portman Rd., New Rochelle, N. Y. A small size, variable-speed hydraulic transmission, the Model T-1, with a capacity up to one hp.

This device provides infinitely variable speeds from zero or neutral to full electric drive motor speed in either direction. This extremely wide range of speeds in either direction, combined with a full neutral position, makes this new hydraulic transmission suited for innumerable machinery drive applications.



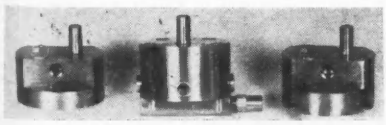
*Portman one-hp transmission*

The transmission is of the multiple piston constant torque type and has a rating up to one hp maximum and an output torque of 52½ lb-in. maximum. It is an entirely self-contained unit and does not require any separate oil sump or reservoir tank of any kind.

The transmission may be furnished with various types of speed controls, including manual by means of handwheel or lever, as well as remote controls. Dimensions are as follows—9¼ in. high, 11 in. overall length including input and output shafts, and seven in. wide, with ¾ in. diameter shafts.

## F-47—Constant Feed Gear Pump

Bijur Lubricating Corp., Long Island City 1, N. Y. A small capacity constant feed gear pump providing 50 cc per min at 100 rpm. Because of this small delivery the correct quantity of oil required by a machine can be fed to it without by-passing a high percentage of the output. Said to be a high efficiency unit, the gear pump maintains a constant feed under high pressure during operation of the machine.



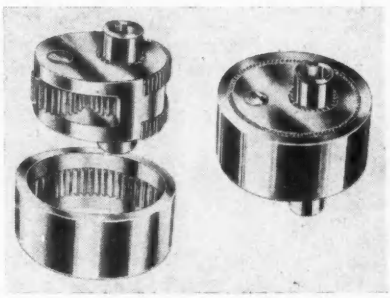
*Bijur universal, reversible, and sump type gear pumps*

There are three types of constant feed gear pumps manufactured by Bijur: The universal; the reversible; and the sump type. The universal gear pump can be mounted in any position, the direction of drive shaft rotation determining the direction of flow. The reversible gear pump maintains flow in one direction only, regardless of change of drive shaft rotation during operation. The sump type gear pump is equipped with an integral fine mesh screen and may be mounted directly in the sump.

Any one of the three gear pumps may be used in conjunction with the Bijur system of metered lubrication.

## F-48—New and Improved Epicyclic Drive

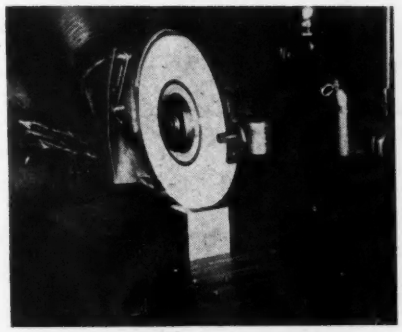
American Brake Shoe Co., New York 17, N. Y. A new and improved epicyclic drive. A simple and efficient means of converting high rotating speeds into slow reciprocating motion, built as an integral unit on anti-friction or plain bearings, depending on power requirements. Test data on compressors and hydraulic pumps are said to show greater efficiency than with more conventional methods of belting or gearing. Design of the drive permits considerable flexibility in both speed and stroke, making possible the use of built-in or direct drive input power where desirable in streamlining or packaging. Multiple units of different gear ratios and strokes may be mounted on a common power shaft. One geared epicyclic unit used in conjunction with a master connecting rod lends itself to radial design in either vertical or horizontal positions, the unit itself replacing the master rod bearing. When synchronous speeds are not required, rolling members may be substituted for the gears, offering greater manufacturing economy. Available for manufacture under license agreement with American Brake Shoe Co.



*Epicyclic drive made by the American Brake Shoe Co.*

## F-49—Improved Grinding Wheel

Chicago Wheel & Manufacturing Co., 1101 W. Monroe St., Chicago 7, Ill. The "Silver Streak," a metallic sheathed frinding wheel. While the wheel is of the vitrified or ceramic bond, certain basic improvements have been incorporated into the bond which, when coupled with the metallic sheathing, are said to provide distinct advantages. The metallic sheathing is in no way detrimental to efficient grinding. There is a pronounced tendency to dissipate heat generated at the arc of contact over the entire area of the wheel. Heat travels rapidly up the metallic sheathing and is rapidly dissipated. The metallic film in no way affects the truing or dressing of the wheel which is handled in the usual manner. The waterproofing qualities of the metallic film on the sides of the wheel keep the coolant at the arc of contact where it is needed for cooler cutting action and to avoid burning of the work. The makers claim the wheel cuts faster and cooler, with greater tool life between grinds. A number of different work classifications can be advantageously handled with this new type of metal-sheathed wheel. Included are surface, internal, and tool-and-cutter grinding.



*Silver Streak grinding wheel*

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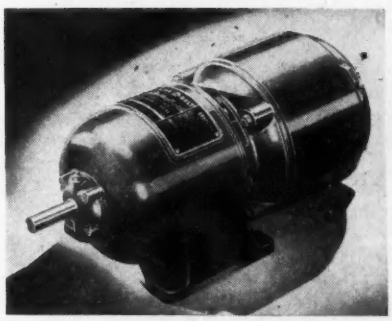
## F-50—Power Transmission Unit



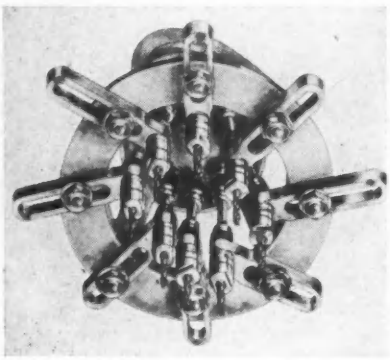
***Link-Belt Co., Chicago 1, Ill. A power transmission unit called the Electrofluid Drive which may be used as a plain unit with a silent chain drive take-off; with gear reduction in-built, connected to a chain roller drive; or as a vertical unit connected to a horizontal roller chain drive. In each case the Electrofluid Drive is an operating unit.***

# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

## F-51—Multiple Drill

Commander Manufacturing Co., Chicago 24, Ill. A new eight-spindle Multi-Drill line. Quickly and easily attached to any drill press, the model 900 multi-drill will drill eight holes at one stroke in any hole pattern on or within a nine



*Commander eight spindle Multi-Drill*

in. circle; minimum center distance ½ in. This new eight-spindle model incorporates the same design and operating features of the six-spindle multi-drill. Fast, easy positioning of the spindles to any hole pattern is accomplished by loosening one nut on each of the eight locating arms, positioning the spindle and tightening the nut.

The housing and gear case are made of special high strength aluminum alloy; the gears are hardened and ground for extra wear, and the universal joints are of heavy duty, high torque block type construction.

## F-52—Air Cylinder

Anker-Holth Manufacturing Co., Port Huron, Mich. A 4.5 in. bore model C air cylinder provided with an adjustable stroke control feature for setting of any stroke length between the eight in. maximum stroke and the six in. minimum stroke lengths of the cylinder.

*Anker-Holth 4.5 in. bore air cylinder*

In addition to the regular double acting piston for operating the piston rod, this cylinder is provided with a stop piston for setting of the required stroke by turning a hand wheel at right hand end of cylinder. The hand wheel acts as a nut over a threaded hollow center shaft which is grooved and keyed to the cylinder end cover and fastened to the stop piston.

Pipe inlet ports are provided in the rod end cover and in the outside end of the hollow center adjusting shaft for operating the double acting piston. A flexible hose connection must be used at the latter part to permit lateral movement of the adjusting shaft. The stop piston is provided with a packing to prevent any leakage of air from this end of the cylinder through the adjustable stroke mechanism.

Cylinders of various bores and strokes can be made with the adjustable stroke control feature to suit individual requirements.

## F-53—Pneumatic Chuck

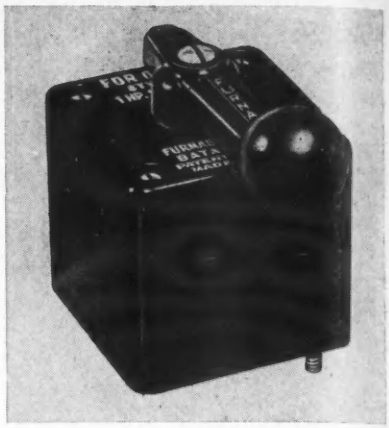
The Cushman Chuck Co., Hartford 2, Conn. An air operated power chuck said to provide for a quick and simple, yet positively accurate method of adjusting and locking chuck jaws within close limits. This chuck, called the Accralock, has only a few parts with adjustment confined to only two screws. After the jaw adjusting key and the

*Cushman Accralock serrated adjustable jaw air operated power chuck*

top jaw have been placed in position on the master jaw in the serrations nearest to desired position, precision adjustment of the jaw back or forward is accomplished by motion of the adjusting key in the angular serrations, controlled by the side adjusting screws. Once locked, further movement is impossible because the adjusting screws themselves prevent sideways motion of the key.

## F-54—Motor Controllers

Furnas Electric Co., Batavia, Ill. A new "A" series of one-hp controllers designed for medium industrial or workshop equipment is available in four switching arrangements; reversing, two-speed, series-parallel and



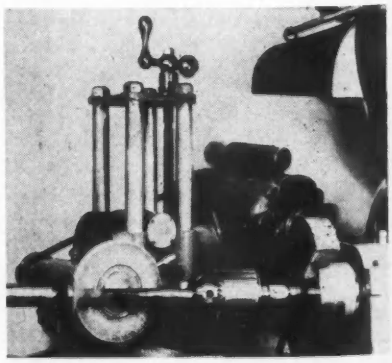
*New "A" series one hp Furnas motor controller*

three pole "off-on." This recently-announced series has plastic case, handle and contact rotor. Several mounting arrangements are available such as an angle bracket, flange mounting plates and plates for attachment to several styles of standard outlet boxes. They are rated at one hp single and three phase 110 to 550v a-c; ¼ hp 115 to 230v d-c. Non-inductive loads; 10 amp 110v a-c, 5 amp 220v a-c.

## F-55—Lathe Converter

Master Manufacturing Co., 1300 Ave. A, East, Hutchinson, Kan. The Master lathe converter. The manufacturer states that this converter is unique in that it performs the operations of a number of special purpose machines. It is self-powered and can be used as an independent unit or in conjunction with lathes, milling machines, shapers, planers, boring mills, etc. Among the operations that can be performed are internal and external keyway milling, thread milling, spline milling, gear cutting, boring, drilling, circular milling, cylindrical grinding, face-plate grinding, internal grinding, tool grinding and thread grinding. A 40 to 1 geared dividing head for lathes permits all types of precision indexing. Operations can be performed upon any work-piece that can be held between centers, in chuck or on face plate of lathes.

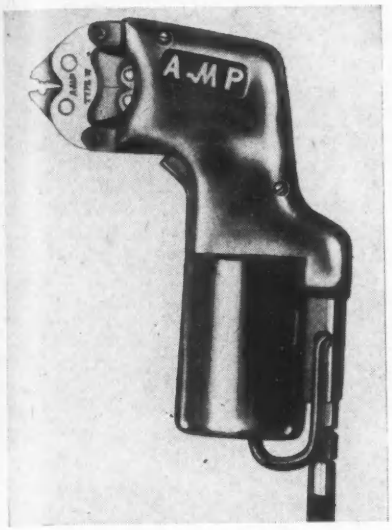
The converter is made in three sizes to fit lathes from nine-in swing to 60-in. swing and is powered with motors of ¼ hp to 1½ hp.



*Model B Master lathe converter refacing a tractor valve in lathe*

## F-56—Pneumatic Hand Tool

Aircraft-Marine Products, Inc., Harrisburg, Pa. A new pneumatic powered hand tool designed for production line assembly, that is said to install solderless electrical terminals with the speed, uniform pressure, and precision of a power press. The manufacturer says no special skill is required to operate this lightweight production tool which is small enough to use in "tight" places and "hard-to-reach" jobs. Trigger-type control and fast-acting mechanism of unusual design provides high installation speed, making completed connections as fast as an operator can insert the wire and pull the trigger. Tool steel-crimping jaws are readily interchangeable for the various types of solderless terminals manufactured by the company. Made for wire sizes from 22 to 14, each set of jaws accommodates a number of sizes. The exclusive toggle action employed provides 2000 lb crimping pressure from 85 lb air pressure.




*AMP pneumatic hand tool for installing solderless wire terminals*

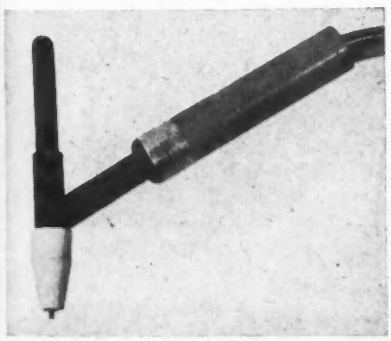
## F-57—Water-Cooled Welding Torch

The Linde Air Products Co., Unit of Union Carbide and Carbon Corp., 30 E. 42 St., New York 17, N. Y. A new water-cooled Heliarc torch designed for inert gas-shielded arc welding. Known as the HW-4, this torch features water cooling, a lightweight flexible power cable, a gas cup made of non-conducting material, and an adjustable tungsten electrode. The torch head and handle and the gas cup are fully insulated.

Water-cooling the torch makes possible the use of a power cable capable of carrying 250 amp. Cooling water flows through the torch and handle and out around the power-supply cable. A safety fuse is inserted in the water discharge line to shut off the power if the water should stop flowing, or the torch become overheated. Direct current, straight or reverse polarity, or high-frequency stabilized alternating current can be used.

A fully insulated ceramic gas cup directs the flow of gas to the weld area, blanketing the electrode, arc, and molten metal from the atmosphere. The insulated cup prevents accidental arcing to adjacent parts of the workpiece or jig. An electrode extension with a removable cup permits easy adjustment of the virtually non-consumable tungsten electrode.

The Heliarc process employs the principle of shielding the weld area from the oxidizing atmosphere under a blanket of inert, monatomic gas, such as argon. Metals such as stainless steel, aluminum, Monel, Inconel, and magnesium are welded without the use of flux with this process. The process is said to overcome previous difficulties in welding corrosion-resistant metals.



*The new HW-4 Heliarc welding torch.*

## F-58—Tool and Die Welding Electrodes

Welding Equipment and Supply Co., 223 Leib St., Detroit 7, Mich. An improved line of Eureka tool and die welding electrodes for use on a-c and d-c arc-welding machines. The alloyed mineral coatings on the new line are reported to enhance the desirable spray action of the arc. Manipulation characteristics are also improved, it is claimed.

The manufacturer states that an outstanding feature of welding electrodes is the ease of slag removal after welding. Ten different Eureka electrodes are available in the following types: Water hardening, oil hardening, air hardening and hot-working tool steels; high-speed steel; chrome-nickel alloy for use on drawing; forming and forging dies.

## F-59—Carbide Slitting Saw

Gay-Lee Co., Ferndale 20, Mich. A carbide slitting saw designed to reduce tool breakage. This saw is made with a steel hub permanently bonded to a cemented carbide blade, and is intended to eliminate fracturing due to the strain imposed by mounting screws and nuts.

In addition to the longer life said to be possible by this innovation, teeth are generated to provide maximum strength and long life. Cutters are slightly concave to insure proper clearance. The new blades are said to perform undercutting and "U" slotting operations to exceptionally close tolerances. The hub is designed to support the cutting edge.

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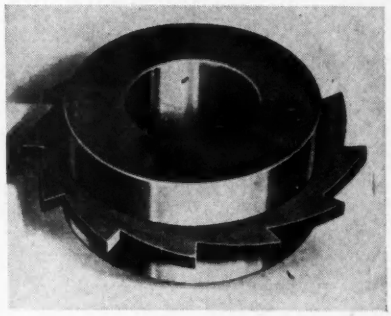
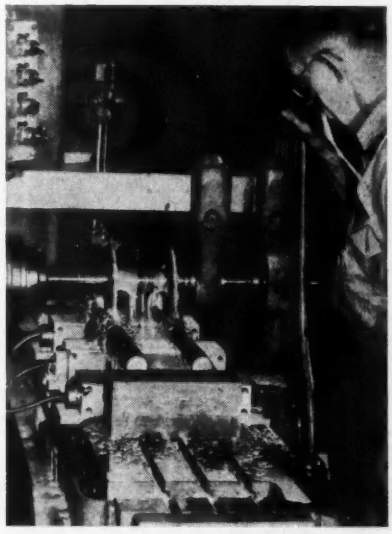


*Gay-Lee carbide slitting saw*

## F-60—Magnetic Chucks



***Rockford Magnetic Products Co., 1302 18th Ave., Rockford, Ill. Power-Grip Viking magnetic chucks. This illustration shows three Viking chucks with V-block fixtures, used with an end stop, to hold steel bars two-in. in diam by 25-in. long. Keyways five-in. long by ½-in. wide by 0.300 in. deep are milled in center and at each end, using six-in. diam, ½-in. wide, staggered tooth high-speed steel side mill. Feed rate is 7.13 in. per min. with rapid traverse at 300 in. per min. In this case, two bars are milled at a time, but as many as six bars can be milled with a similar set-up.***

# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

## F-61—Profile Recorder

Physicists Research Co., 321 S. Main St., Ann Arbor, Mich. The Proficorder, a mechanical electronic shop instrument which provides a magnified chart record of the shape, height and spacing of surface irregularities.

This instrument will show the true profile of practically any machined or finished surface. It is said to be highly flexible as to the amount of detail recorded; and it permits tracing widely varied surfaces at the same magnification for direct comparison of profiles.

The Proficorder is designed particularly to show waviness, bows, steps and other surface irregularities spaced approximately 1/32 in. apart or farther, rather than the more closely spaced irregularities which make up surface roughness. Thus, in machining and grinding applications, the primary

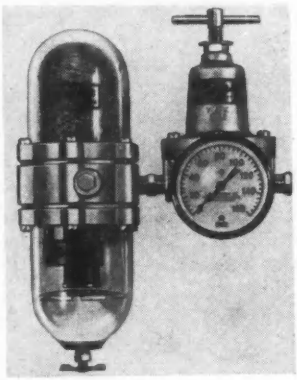
*The Proficorder*

function of this instrument is to show irregularities caused by the machine or set-up used to produce the surface, rather than showing roughness caused by the cutting action of the tool or wheel. However, fine roughness irregularities can also be recorded in full detail.

A Proficorder includes: a tracer with diamond tracing point; a piloting fixture with motor-driven slide for moving the tracer; and an Amplicorder unit, consisting of an amplifier, the chart recording mechanism and the control panel, assembled in a cabinet which is mounted on casters for easly portability. Various tracers and piloting fixtures provide for profiling on flat or cylindrical surfaces, external or internal, and on remote portions of large surfaces such as machined base plates, rolls and cylinder bores. Maximum length of trace is approximately two in.

## F-62—Purifier and Regulator Unit

C. A. Norgren Co., 222 Santa Fe Dr., Denver 9, Colorado. A combination purifier and standard pressure regulator with gage, the Puraire. This unit is engineered to improve paint and lacquer spray room operations and to reduce moisture blemish rejects by elim-



*Norgren Puraire, a combination purifier and regulator unit*

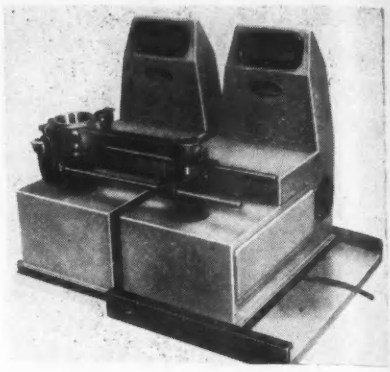
inating air-borne oil emulsion, moisture and solids.

The purifier is divided into two chambers: a lower chamber which contains double Monel wire screen and baffle plate; and an upper chamber which contains a blue yarn absorbent element. Moisture is separated from the air in the lower chamber by centrifugal force. It collects on the sides of the bowl and runs down below the baffle plate where it accumulates and can be drained off instead of being driven along with the air. The Monel wire screen stops dust, dirt, and pipe scale.

The blue yarn absorbent element in the upper chamber turns pink when moisture gets past the filter. This danger signal tells the operator the lower filter bowl needs to be drained of accumulated muck and water. The unit is designed to serve two spray guns operating simultaneously, and operates with minimum pressure drop at the guns. It is offered in ¼ in. size only.

## F-63—Scale for Connecting Rods

The Exact Weight Scale Co., Columbus, Ohio. Model No. 4152-A scale for classifying connecting rods, and also for determining the amount of material removed in machining the rod to correct weight. The equipment consists of two special Shadograph scales with adjustable rod holder. The scale on the left is used for determining the weight of the heavy end, and the scale on the right to determine the weight of the light end. The scales are mounted on a base, which also provides for



*Model No. 4152-A connecting-rod scale.*

different length rods. Both the rod holder and the base plate are adjustable within a range of six in.

## F-64—Air Screw Drivers

The Aro Equipment Corp., Bryan, Ohio. Two new air screw drivers, models 7037 and 7039, for No. 4 to No. 8 wood or machine screws. The tools incorporate a new friction clutch attachment, using ¼ in. hex shank bits or ¼ in. hex adapter with square drive for nut setting. The new friction clutch attachment is designed to permit a greater travel range of the adjusting nut, which controls the tension of the clutch spring. The angle of the friction

jaws is such that the jaws will slip freely when the adjustment or tension is at a minimum or maximum.

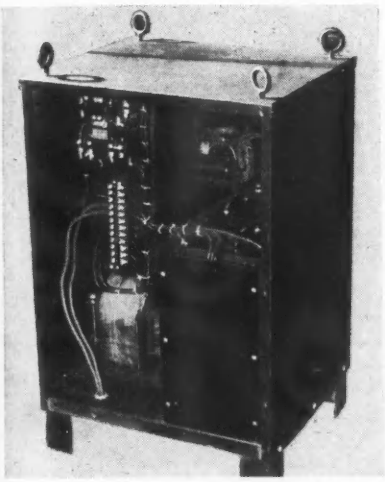
Model 7037 has a lever throttle. Model 7039 is equipped with a pistol grip. Overall length of the tool is 8¼ in.; weight, 1¾ lb. Speed is adjustable to 1800 rpm. The tools are furnished complete with eight ft of ¼ in. hose with fittings; speed regulator; one finder, three bits of size specified. A suspension bail is supplied with Model 7037.

## F-65—Power Packs For D-C Motors

Westinghouse Electric Co., Pittsburgh 30, Pa. A new selenium rectifier power pack that makes possible the operation of d-c motors from a-c service. This means that the adjustable speed features of the d-c motor are readily available to every plant with an alternating current distribution system.

Simplicity is the keynote of these power packs; their construction involves only the selenium rectifier, the transformer, the a-c contactor and cabinet; their installation involves no special foundation requirements, therefore, they can be located off-the-floor out-of-the-way; and, their maintenance involves only periodic inspections as the only rotating parts are the fan and motor on the 7.5 to 15 hp sizes.

The power factor from 40 per cent



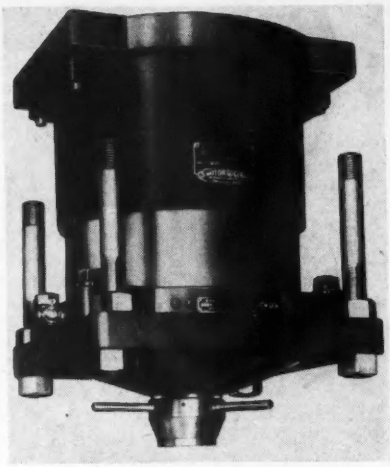
*Westinghouse selenium power pack for d-c motors.*

load to full load is 95 per cent or better; efficiency of the rectifier alone is 80 per cent for the self-cooled ratings and 72 per cent for the fan cooled.

These power packs are available in ratings of 1-3-5-7.5-10 and 15 hp for conversion of three phase a-c service to 230 volts d-c service.

## F-66—Pneumatic Die Cushion

Dayton Rogers Manufacturing Co., 2835 12th Ave. South, Minneapolis 7, Minn. Model D-1 universal penumatic die cushion, in 10 sizes from five in. to 24 in., and capacities from one to 500-ton. The primary objective of these pneumatic die cushions is to eliminate and supersede springs and rubbers commonly used for various deep drawing operations. This newly-designed Model D-1 includes an adjustable handwheel stop, which allows the press operator to stop the hardened and ground pin pressure pad at a predetermined lift. It is provided with a large leader pin or cylinder rod, which guides the pin pressure pad compensating for off-center loading.



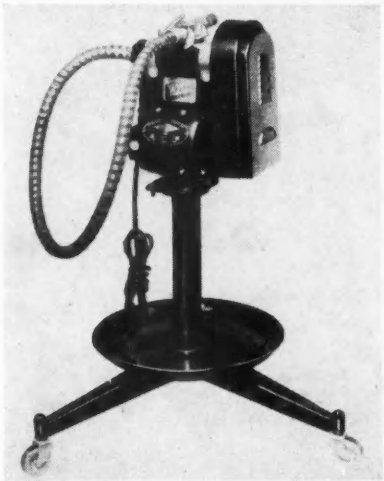
*Rogers model D-14 pneumatic draw cushion*

This cushion can be used for all deep drawing operations, but is adaptable for all dies ejector requirements and pressure pad controls on a large percentage of forming dies.

## F-67—Flexible Shaft Machine

Wyzenbeek and Staff, Inc., 838 W. Hubbard St., Chicago 22, Ill. The Wyco Tool Maker's Streamflex. This is described as a three-speed V-belt drive machine made in two speed ranges: standard speeds of 1400, 2400, and 4500 rpm; and high speeds of 1800, 3600, and 7200 rpm. Features are said to include complete enclosure of the V-belt drive by a sliding, ventilated pulley guard which can be raised when necessary to change speeds, and a locking shaft holder which will hold shaft and grinding wheel in fixed position for stationary grinding.

All Streamflex machines are designed for a wide variety of grinding, sanding,



*Wyco Tool Maker's Streamflex*

polishing or rotary file work on molds, patterns, dies or on stainless steel fabrication. All units are equipped with Wyco shafts having a non-metallic innerliner.

Five Streamflex models are available, including both bench and floor type

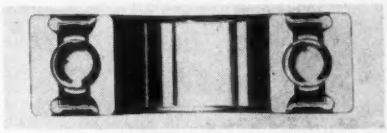
# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

machines, ⅓ hp in standard or high-speed ranges, and a ½ hp floor-type machine. All floor type models can also be furnished with completely enclosed cabinet bases containing tool compartments.

## F-68—Sealed Ball Bearing

The Marlin-Rockwell Corp., Jamestown, N. Y. A new "Synthe-Seal" ball bearing. This is a standard-dimension bearing equipped with seals on one or both sides. These seals are made of soft synthetic rubber with a steel core for strength. The pliable synthetic rub-



*M-R-C Synthe-Seal ball bearing*

ber wiping lip is in contact with a ground curved surface on the inner race.

The seal is said to be exceptionally efficient in the retention of lubricant and the bearings may require replenishment only at infrequent or long intervals, or when the machine is being overhauled, or not at all depending on service operating requirements.

Synthe-Seal bearings are manufactured in standard SAE single-row bores, OD's and widths. Popular sizes of Synthe-Seal bearings are now available and other sizes are being tooled for.

## F-69—New Series of Cutting Oils

E. F. Houghton & Co., Philadelphia 33, Pa. Four new series of Cut-Max straight cutting oils.

The Cut-Max 100 Series includes a range of viscosities of cutting fluids high in saponifiable oil content, but containing no sulphur or extreme pressure additives.

The 200 Series is for heavy-duty machining, being highly fortified with sulphur, E.P. and saponifiable. Included are five oils identical in additive content and varying only in viscosity, so that blends may be made to suit the needed fluidity without altering additive balance.

The 300 Series includes oil high in saponifiable content and active sulphur but free from chlorine—for use on bright machined surfaces when any

## NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

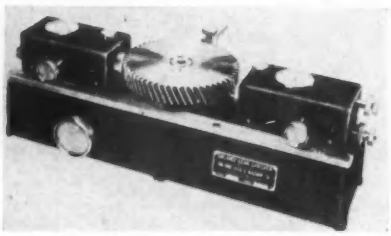
*For additional information regarding any of these items, please use coupon on page 120*

slight staining or dulling is objectionable.

The Cut-Max 400 Series is a completely new development—light-colored, clear oils mildly but effectively treated. They are said to meet a demand for low-cost high quality cutting fluids for automatics and high production jobs where feeds are light and speeds high.

### F-70—High-Speed Gear Checker

Orlandi Gear and Machine Co., 16195 Meyers Rd., Detroit 27, Mich. A new gear checking machine for high-production checking of spur,

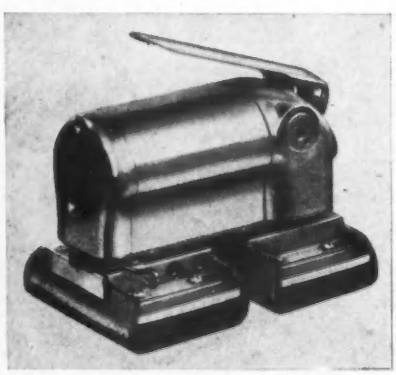


*Orlandi gear checker*

helical and worm gears with pins and balls as well as three-wire checking of thread forms and precision parts. Pitch diameter, concentricity, size, tooth spacing, backlash and parallelism can be checked as fast as a gear can be placed on the anvil or locating pin, lifted off and replaced with another. No master gear is required.

### F-71—Lightweight Two-Pad Sander

National Air Sander, Inc., 821 Kishwaukee St., Rockford, Ill. An opposed-action two-pad sander. This light-weight sander weighs only 5½ lb. The two pads operate in a straight line reciprocating action with a stroke of 1½ in. Vibration is eliminated by the opposed action of the pads, consequently this machine may be handled by women operators. It has a huge capacity, and is said to produce an excellent finish quickly and efficiently.



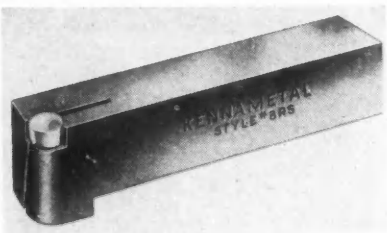
*National opposed-action two-pad sander.*

With this machine the manufacturer offers a group of accessory pads enabling its adaptation to numerous sanding, rubbing and polishing applications on large or small, curved or flat surfaces, on metal, wood, or plastic. Pads can be changed easily. The machine is provided with an automatic feed for water or cutting agent.

### F-72—Carbide Cutting Tool

Kennametal, Inc., Latrobe, Pa. A new line of tools comprising a solid Kennametal round, clamped-on end in a steel holder, and supported by a back-up adjusting screw. Each end of the Kennametal round provides a circular cutting edge. A small section of this edge, depending upon the depth of cut, bears against the work. When this section becomes dull, the clamping screw is loosened, and the Kennametal round is revolved around its axis to provide a new cutting edge. The clamping screw is then retightened.

After being thus indexed several times, until all of the cutting edge of one end of the round has become dull, the round is turned end for end to provide another cycle of cutting. Thus, once the tip is set, it provides a correctly positioned cutting edge throughout the sequence of indexing of both ends—an especially marked advantage



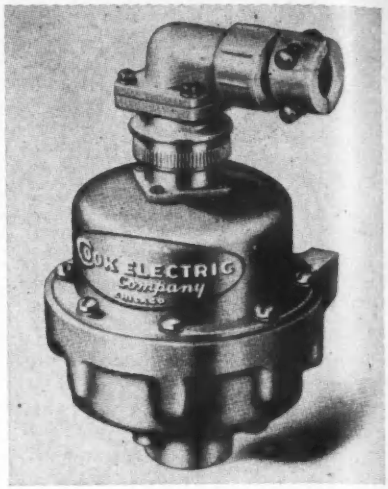

*Single cutting edge tool of solid Kennametal in a steel holder.*

for suitable operations on repetitive, high production jobs.

When both ends of the Kennametal round become dull, it is removed from the holder, reground, and thus made ready for another double cutting cycle.

### F-73—Switch for Pressure Control

Cook Electric Co., Chicago 14, Ill. High pressure control switch. The Cook Hi-Pressure switch is designed for the control of high pressure hydraulic, air and steam systems. It has been used successfully on aircraft installations such as hydraulic landing gears, wing flaps and fuel systems. Other applications include warning and control signals on punch presses and steam boilers. This switch, although compact, is




*Cook Hi-Pressure switch*

said to be engineered for dependable, heavy duty performance.

The switching mechanism is housed in an impregnated aluminum casting. Pipe connection is solid brass with beryllium copper diaphragm brazed onto it. Diaphragm is heat treated for proper spring rate and long life. Metal parts are cadmium plated where necessary. Pipe tap sizes optional on quantity orders.

The circuit of this switch may be supplied to operate on any one of four different pressure ranges—5 to 50, 50 to 200, 200 to 500, and 500 to 2000 psi. The pressure differential between on and off position is approximately 10 per cent of operating pressure. Maximum surge pressure is 2500 psi.

### F-74—All Steel D-C Motor

Westinghouse Electric Co., Pittsburgh 30, Pa. An all-steel-constructed d-c motor. Rolled steel frames with welded-on fabricated steel feet and deep-drawn fabricated steel brackets mean a smaller and lighter motor than its predecessor without sacrifice of electrical characteristics, and the use of prelubricated ball bearings means effectice lubrication for five years or longer without repacking, according to the manufacturer.

On the smaller frame sizes, 204 to F225 (one to three hp) the new design is one frame size smaller. On the larger frame sizes, 43 to 83 (10 to 25 hp) the new design calls for NEMA standard dimension frames 324 to 365. These are smaller in both diameter and length than the comparably rated 43 to 83. On the intermediate frame sizes, 254 and 284 (5.0 & 7.5 hp) there will be no change in size.

These type SK motors are available in sizes from one to 25 hp; in voltages of 115, 230, 550 and 600; in speeds of 100 to 3600 rpm; in open, splash proof, totally-enclosed, non-ventilated, or totally-enclosed fan-cooled construction; in constant or adjustable speed types; in series, shunt or compound wound; and in NEMA frames 203 to 365.

## F-75—New Sunicut Cutting Oils

Sun Oil Co., Philadelphia 3, Pa. A new series of Sunicut oils with "Petrofac." These new oils, retaining the Sunicut name and the numeral designations of the grades they replace, contain a unique polar compound of petroleum origin. Called Petrofac, this product, in combination with the other ingredients of the new Sunicut grades, is said to impart metal-wetting, chip anti-weld and extreme pressure characteristics unsurpassed by anything previously achieved.

The improved grades of Sunicut contain no animal or vegetable fatty oils. Because Petrofac, which replaces the previously used lard oils, is completely of petroleum origin, it cannot support skin-irritating bacterial growth, cannot turn rancid, even with prolonged use. Petrofac is actually germicidal in action.

## F-76—Oil Filter

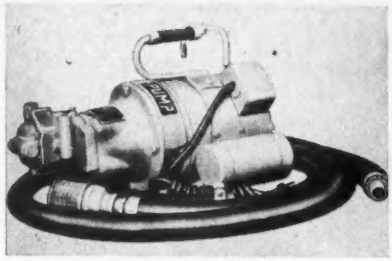
Purolator Products, Inc., Newark 2, N. J. An oil filter that may be used for lubricating oil as well as for hydraulic oil circulation on machine tools.

*Purolator Type P-901 oil filter.*

The Type P-901, shown here, has a one-eighth in. connection for the inlet as well as the outlet. It is made of pressed steel parts and contains the Purolator new micronic filter cartridge which is of the replaceable type.

## F-77—Portable Electric Pump

Gray-Mills Corp., Evanston, Ill. The Handi-Pump, a portable electric pumping unit for fluid handling jobs. This pump can be used for transferring, flushing, spraying, draining or circulating liquids. The unit measures 16 in. long and 10 in. high and is 6½ in. wide. Its net weight is 49 lb. A built-in relief valve is incorporated in its design. The Handi-Pump has a maximum pressure of 25 psi. At 1750 rpm its volume is 6 gpm. The pump is coupled directly to a ¼ hp capacitor-type 110-v 60-cycle, single phase motor and has a carrying handle and built-in switch.



*Gray-Mills Handi-Pump.*

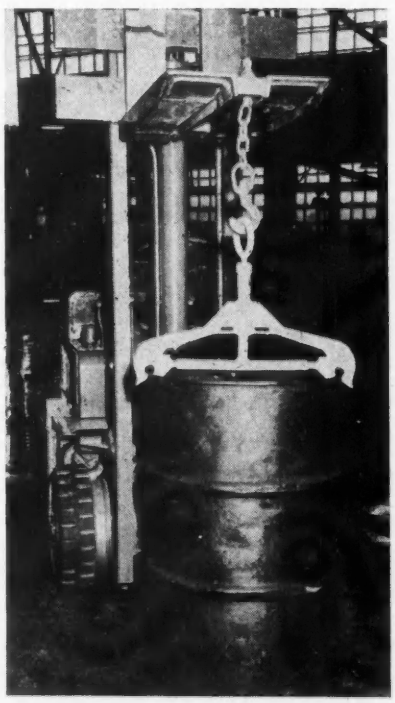
The standard Handi-Pump is of cast-iron construction with brass gears and stainless steel parts. It can also be furnished with an all brass pump body for handling liquids of corrosive nature. It is complete with two six-ft lengths of oil resisting neoprene intake and discharge hoses and an intake filter.

## F-78—New Steel

The Timken Roller Bearing Co., Canton 6, Ohio. A new type of graphitic steel known as 91140, containing free graphite together with diamond-hard carbides. This new steel is said to offer great resistance to wear and have the unique ability to retain lubricants. It has been reported that manufacturers who have tried 91140 for their lathe ways found that it eliminates scuffing and scoring and makes for easier action of the carriage.

## F-79—Fork Truck Clamping Device

Clark Tructractor, Division Clark Equipment Co., Battle Creek, Mich. For safe handling of drums which must be moved singly or in the upright position to prevent spilling, a new clamping device which is easily adapted



*Clark clamping device for fork trucks.*

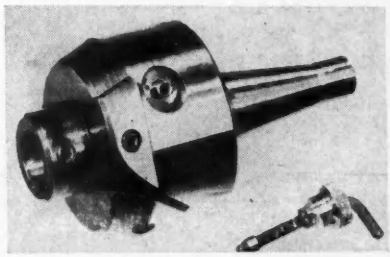
# NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

to any of their fork truck models. The clamp is self-adjusting for diameters 21½ in. to 24 in. and employs a star cam permitting the operator to release the drum without dismounting. Clamping over the chime the device grips securely throughout transportation and carries up to 700 lb. This new clamp may also be used on fork trucks equipped with crane, swinging boom, or special fork extension attachments.

## F-80—Boring Head

Everede Tool Co., Chicago 39, Ill. An offset boring head furnished with bushings to allow the use of straight type boring bars. With the boring head lead screw placed off center, the combination affords adjustment in the length of bar for shallow and deep hole



*Everede offset boring head*

boring. The graduated dial can be set to zero independent of the lead screw for quick adjustment. The boring head is made in two sizes, the Nos. 2-50, with a one-half in. boring bar capacity capable of boring holes up to 2¼ in. diam., and the No. 4-50 with a 1½ in. boring bar capacity capable of boring holes up to six in. diam.

## F-81—Oil Mist Lubricator

SKF Industries, Inc., Philadelphia 32, Pa. An oil mist lubricator designed to lengthen the life of spindle bearings. The manufacturer states that this oil mist lubricator, according to tests, extends the average life of grinding-spindle bearings, for example, from several hundred to as much as several thousand hours of operation and results in savings in lubricants up to 90 per cent. Several drops of oil per hour will lubricate a medium size ball bearing operating at moderately high speed.

A mixture of air and oil under pressure flows through the bearings, then the seals, and exhausts into the atmosphere. The lubricator is equipped with

(*Turn to page* 186, *please*)

# PUBLICATIONS AVAILABLE

**Publications listed in this department are obtainable by subscribers through the Editorial Department of AUTOMOTIVE INDUSTRIES. In making requests please be sure to give the NUMBER of the item concerning the publication desired, your name and address, company connection and title.**

## D-50—Clark Trucloader

Clark Equipment Co., Clark Tructractor Div.—A new booklet describes and illustrates the new 1000 lb forklift truck for handling a wide variety of lift-haul chores common to most industrial plants. Illustrated by action photographs showing the Trucloader at work in several manufacturing plants, the booklet presents 14 tabloid descriptions of the assignments. Title of booklet is "14 of the 101 Ways to Cash In on the Clark Trucloader."

## D-51—Precision Castings

Michigan Steel Casting Co.—An attractive booklet in color describes and illustrates the Misco precision casting process and its advantages. The booklet also contains information and photographs on the engineering properties of the various Misco Precision Castings.

## D-52—Rubber Lined Steel

Metalweld, Inc.—4-page bulletin giving facts about rubber lined steel in industry and other protective surface coatings. Featured are tables giving resistance characteristics of rubber linings to inorganic acids, inorganic salts, alkalies and organic materials. Other topics covered are chemical, abrasion and temperature resistance and interesting data on a new form of rubber lining, and the Vulcalock process for permanent bonding to steel surfaces.

## D-53—Oil Retaining Porous Bronze Bearings

Bound Brook Oil-Less Bearings Co.—A new ready-reference Stock List No. 3, of Compo Oil-Retaining Porous Bronze Bearings. Many new sizes in sleeve type, flanged and self-aligning bearings are included, together with solid plugs and washers. Supplementing the listings of stock sizes is data on material specifications, standard tolerances, installation procedure and permissible loads for Compo bearings carried in stock.

## D-54—Welding of Nickel Alloys

International Nickel Co., Inc.—16-page booklet on the materials required for the metal-arc, oxy-acetylene and submerged melt welding of nickel and the high nickel alloys. It lists such general information as the type of welding rods to use, recommended amperages for electric-arc welding and the proper flux to select for gas welding and brazing. Information also is included on technical booklets on the subject of welding of the high nickel alloys and sources of supply for electrodes and gas welding wire.

## D-55—Universal Joints

Borg-Warner Corp., Mechanics Universal Joint Div.—An attractive catalog in color describes a few of the manufacturing and testing operations in the company's plant. Various types of universal joints are described and illustrated and their application, advantages and design features given. Illustrations also include line drawings of the various parts and dimension charts.

## D-56—Hole Punching Units

Wales-Strippit Corp.—A new 32-page color catalog illustrated with photographs and tracings, gives information on Wales Type BL Hole Punching Units. Photographs illustrate how to set up these units on templates and T-slotted plates in press brakes and stamping presses, and on rails in press brakes.

## D-57—Welders and Brazers

Banner Products Co.—Pictorial booklet showing their complete line of welders and brazers. Included are illustrations covering air and foot operated spot and butt welders, brazers, portable gun and portable brazer.

## D-58—Lubrication in Forging Operations

The Texas Co.—In the September issue of *Lubrication*, Vol. 33, No. 9,

(*Turn to page* 122, *please*)

*TIME SAVER COUPON for your convenience in obtaining, WITHOUT OBLIGATION, more information on any one or more of the publications described above OR New Production and Plant Equipment OR New Products items described on following pages.*

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**Automotive Industries,**

**Chestnut & 56th Sts., Philadelphia 39, Pa.**

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# LOK-THRED STUDS are TIGHTER and STRONGER

**IN ANY APPLICATION** where studs are used, "LOK-THRED" Studs will lock more securely and prove stronger in both tension and torsion than American National Threads.

The "LOK-THRED" design avoids the chief weakness of ordinary interference fit, which places the metal of the receiving thread under shear and thus tends to cause a bursting or splitting action.

Note these other important advantages of "LOK-THRED" which are explained fully in the new booklet pictured here:

1. **Modified American National Thread permits use of standard tools. (Page 6.)**
2. **Does not require selective fits. (Page 6.)**
3. **Locks securely and becomes tighter in service. (Page 9.)**
4. **Carries entire normal working load on 6° angle at root of thread under high compressive prestress. (Page 11.)**
5. **Does not gall when being driven nor fret in service. (Page 12.)**
6. **Stronger in both tension and torsion than ordinary American National Threads. (Page 12.)**
7. **Has much higher fatigue limits than studs with conventional threads. (Page 13.)**
8. **Acts as dowels and taper pins. (Page 16.)**
9. **Seals positively and eliminates added bosses and blind tapping. (Page 17.)**
10. **Re-usable and on any re-application less than one-half additional turn brings torque back to its original installation value. (Page 17.)**

*Write for "LOK-THRED" Booklet for full information.*

National HEADED AND THREADED PRODUCTS

**THE NATIONAL SCREW & MFG. COMPANY, CLEVELAND 4, OHIO**

## Many Commissions Study Aircraft Industry Problems

If the number of groups looking for a solution to the problem of the domestic aircraft industry is any criterion, the industry should be in fine shape sometime during 1948. State, War, Navy, Commerce and the Air Coordinating Committee have been trying to formulate plans to get the industry out of its postwar doldrums for more than a year. Two new groups have been added to this list within the past month. Stealing a march on Congress in mid-July, when the legislators were debating the merits of a bill creating a National Aviation Council, President Truman appointed a five-man temporary Air Policy Commission, composed of private citizens, to aid in formulating a national aviation policy. This group has already begun its work and will submit its final recommendations by January 1, 1948. Completely discarding the National Aviation Council, Congress came up with a bill establishing a Temporary Congressional Aviation Policy Board, composed of five members of each House. The President has since approved this measure.

Compared with a peak monthly wartime average rate of about 8000 planes, last year 1330 military planes were produced. Money appropriated for plane purchases during the current fiscal year will probably limit military procurement to about 1700 craft, as compared with estimates of from 3000 to 5000 planes required annually as the absolute essential for these troubled times. Indicative of the state of the industry is the fact that the RFC has had to step in with funds to keep a few companies financially sound. Even with a sound policy and stepped-up military procurement, it is estimated that it would take two years for the industry to get back to the wartime rate of production.

The answers are not easy. Government subsidies have been ruled out, and as a result Washington has witnessed the creation of these new boards in an effort to establish a national policy that would meet the industry's problems in addition to solving the national security question involved. The commission appointed by Mr. Truman was directed to study such questions as "the current and future needs of American aviation, including commercial air transportation and the utilization of aircraft by the armed services; the nature, type, and extent of aircraft and air transportation industries that are desirable or essential to our national security and welfare; methods of encouraging needed developments in the aviation and air transportation industry; and improved organization and procedures of the government that will assist it in handling matters efficiently and in the public interest."

The President pointed out, however, that "the final recommendations of the Commission must go beyond the limits of any one phase of aviation. They should be so broad in scope and purpose that they will assist in revising old policies and framing new ones, and will serve as a guide for formulating a carefully considered national air policy." In general, the above objectives are similar to those of the Temporary Congressional Aviation Board.

# PERSONALS

*Recent Personnel Changes and Appointments at the Plants of Automotive and Aviation Manufacturers and Their Suppliers.*

Nash Motors Div., Nash-Kelvinator Corp. — The following appointments have been announced: **J. B. Huntress**, Asst. Director of Advertising and Sales Promotion; **W. A. Keller**, Sales Promotion Manager; **Jesse M. Foltz**, Asst. Sales Promotion Manager; **S. W. Williamson**, Director of Training.

General Motors Corp., Chevrolet Motor Div.—**W. L. Tucker** appointed Asst Manager, Service and Mechanical Dept.

Leeds & Northrup Co.—**L. R. Garretson** has retired as Advertising Manager because of ill health.

Northrop Aircraft, Inc. — **John B. Clark**, Director of Industrial Relations at Hawthorne Aircraft plant.

Allegheny Ludlum Steel Corp.—**E. B. Cleborne**, elected Executive Vice-President.

Glenn L. Martin Co. — **Matthew M. Gouger**, elected a Director and appointed Vice-President in charge of Public Relations and Personnel.

Willys-Overland Motors — **Robert A. Weinhardt**, appointed Automotive Power Plant engineer.

Ethyl Corp.—**Edward L. Shea**, named President to succeed **Earle W. Webb**, who becomes Chairman of the Board.

Mid-States Equipment Corp. — **Marshall E. Neil**, General Sales Manager.

Cadillac Motor Car Div., General Motors Corp.—**Charles W. Schooley** appointed Merchandising Manager of the division.

Aircraft Screw Products Co.—**Alfred Marchev**, elected to the Board of Directors.

Dana Corp.—**Earle W. Pughe**, Assistant to the Executive Vice-President.

David Gordon & Co.—**David Gordon** elected President.

Homestead Valve Mfg. Co. — **S. C. Mahood**, Sales Office Manager, Hypressure Jenny Div.

United States Rubber Co. — **A. G. Westlund**, Manager, Sales Production Coordination Dept., Tire Div.

R-S Products Corp.—**David W. Hopkins**, appointed Executive Vice-President.

Clayton Manufacturing Co. — **D. T. Ankeny**, Sales Manager of Dynometer Div.

Kaiser-Frazer Export Corp. — **Rene Eberhard**, made European Regional Director.

The B. F. Goodrich Co.—**Howard F. Kidwell**, in charge of Fleet Sales, including national account sales and state business. **Thomas L. Jenkins**, in charge of Industrial Tire Sales.

McCord Corp.—**Alfred W. Gardes**, appointed Executive Engineer.

ACF-Brill Motors Co.—**F. W. Kateley**, Chief Engineer and **E. G. Mathauer**, Asst. Chief Engineer.

# Publications Available

(*Continued from page* 120)

is an interesting article on lubrication in forging operations, well illustrated and diagrammed.

### D-59—Welding and Cutting Equipment

Victor Equipment Co.—A new color catalog illustrating Victor gas welding and flame cutting apparatus. Price list is included and a page of cutting tip information.

### D-60—Air Filters

American Air Filter Co., Inc.—The application of replaceable type air filters for ventilating and air-conditioning systems is explained in a new 8-page booklet. Descriptions and illustrations of each type filter are given, together with instructions for maintenance and detailed engineering and installation data.

### D-61—Metal Working Chemicals and Processes

American Chemical Paint Co.—Color folder, giving a quick reference list of rust proofing chemicals, protective coatings, metal cleaning chemicals and inhibitors.

*The "Full Jeweled" 7½ hp Mercury "Rocket Deluxe" outboard motor, manufactured by Kiekhaefer Corporation, Cedarburg, Wisconsin.*

## Needle Bearings step up performance . . .

of 2-cycle engines by providing greater mechanical efficiency, longer engine life and reduced maintenance. These outstanding features in turn build sales and win new friends

## For Mercury outboard motors . . .

made by the Kiekhaefer Corporation, Cedarburg, Wis. Torrington Needle Bearings in the wrist pins, connecting rods and crankshaft mains of the power head and on the drive shaft and propeller shaft have conclusively demonstrated the advantages of anti-friction operation in compact, high-speed 2-cycle engines.

Your product's performance and its sales may also benefit from the advantages of Needle Bearings—compact design, high capacity, low coefficient of friction and efficient lubrication. Write for further information.

**THE TORRINGTON COMPANY**

TORRINGTON, CONN. SOUTH BEND 21, IND.

*Offices in All Principal Cities*

# TORRINGTON BEARINGS

• NEEDLE • SPHERICAL ROLLER • STRAIGHT ROLLER • TAPERED ROLLER • BALL •

# 1947 Machine Tool Show Exhibitors

***(This alphabetical compilation is the latest listing available Sept. 1. Figures in parentheses are company booth numbers at the show Sept. 17-26 at the Dodge Chicago plant).***

**Abrasive Machine Tool Co.,**
Dexter Road,
East Providence 14, R. I. (126)

**Acme Equipment Co., Inc.,**
126-128 Clinton St.,
Chicago 6, Ill. (571)

**Acme Industrial Co.,**
200-214 N. Laflin St.,
Chicago 7, Ill. (646)

**Ahlberg Bearing Co.,**
3025 W. 47th St.,
Chicago 32, Ill. (673)

**Aircraft-Marine Products, Inc.,**
1523 N. Fourth St.,
Harrisburg, Pa. (33E)

**The Ajax Manufacturing Co.,**
1441 Chardon Road,
Cleveland 17, Ohio. (640)

**Allegheny Ludlum Steel Corp.,**
532 Oliver Building,
Pittsburgh 22, Pa. (645)

**Allen-Bradley Co.,**
136 W. Greenfield Ave.,
Milwaukee 4, Wis (237)

**The Louis Allis Co.,**
427 E. Stewart St.,
Milwaukee 7, Wis. (143)

**American Broach & Machine Co.,**
Div. of Sundstrand Machine Tool Co.,
Ann Arbor, Mich. (22)

**American Machine & Foundry Co.,**
5502 Second Ave.,
Brooklyn 20, N. Y. (47B)

**American Machine Tool Distributors' Association** - 505 Arch St.,
Philadelphia 6, Pa. (1A)

**The American Tool Works Co.,**
Pearl and Eggleston Aves.,
Cincinnati 2, Ohio (57)

**Ampco Metal Inc.,**
1745 South 38 St.,
Milwaukee 4, Wis. (328I)

**Anchor Coupling Company,**
Libertyville, Ill. (679)

**Anderson Bros. Manufacturing Co.,**
1907 Kishwaukee St.,
Rockford, Ill. (317I)

**F. E. Anderson Oil Co.,**
Portland, Conn. (54B)

**Anker-Holth Manufacturing Co.,**
2723 Connors St.,
Port Huron, Mich. (243)

**The Apex Tool & Cutter Co., Inc.,**
235 Canal St.,
Shelton, Conn. (624)

**Armstrong-Blum Manufacturing Co.,**
5700-5800 West Bloomingdale Ave.,
Chicago 39, Ill. (550)

**Armstrong Bros. Tool Co.,**
317-357 N. Francisco Ave.,
Chicago 12, Ill. (406)

**The Arrow-Hart & Hegeman Electric Co.,**
Hartford, Conn. (602)

**Arter Grinding Machine Co.,**
15 Sagamore Road,
Worcester 5, Mass. (31)

**Automatic Transportation Co.,**
101 West 87th St.,
Chicago 20, Ill. (52)

**Automotive Industries**
5601 Chestnut St.,
Philadelphia 39, Pa. (449)

**The Avery Drilling Machine Co.,**
Cincinnati 1, Ohio (467)

**Axelson Manufacturing Co.,**
Vernon Station,
Los Angeles 11, Calif. (232)

**Baker Brothers, Inc.,**
Toledo 10, Ohio (639)

**Balcrank, Inc.,**
Cincinnati 9, Ohio (328F)

**Barber-Colman Co.,**
Rockford, Ill. (523)

**Bardons & Oliver, Inc.,**
1133 West 9th St.,
Cleveland 13, Ohio. (49)

**W. F. & John Barnes Co.,**
301 South Water St.,
Rockford, Ill. (129)

**Barnes Drill Co.,**
814-830 Chestnut St.,
Rockford, Ill. (42)

**Barrett-Cravens Co.,**
3255 West 30th St.,
Chicago 23, Ill. (155)

**Baush Machine Tool Co.,**
156 Wason Ave.,
Springfield 7, Mass. (38)

**Bear Manufacturing Co.,**
Rock Island, Ill. (33BB)

**Charles H. Besly and Co.,**
118-124 North Clinton St.,
Chicago 6, Ill. (275)

**Bijur Lubricating Corp.,**
43-01 Twenty-Second St.,
Long Island City 1, N. Y. (482)

**Black Drill Co.,**
1400 E. 222nd St.,
Cleveland 17, Ohio. (40A)

**The Blanchard Machine Co.,**
64 State St.,
Cambridge 39, Mass. (226)

**The Bodine Corp.,**
317 Mountain Grove St.,
Bridgeport 5, Conn. (663)

**The Boye & Emmes Machine Tool Co.,**
125 Caldwell Drive,
Cincinnati 15, Ohio. (611)

**The Bridgeport Safety Emery Wheel Co.,**
1299 West Broad St.,
Stratford, Conn. (313)

**The Bristol Co.,**
Waterbury 91, Conn. (47A)

**Brown & Sharpe Manufacturing Co.,**
235 Promenade St.,
Providence 1, R. I. (505)

**Bryant Chucking Grinder Co.,**
Springfield, Vermont. (525)

**Buffalo Forge Co.,**
Buffalo 5, N. Y. (616)

**Buhr Machine Tool Co.,**
839 Greene St.,
Ann Arbor, Mich. (158)

**The Bullard Co.,**
286 Canfield Ave.,
Bridgeport 2, Conn. (314)

**The Bunting Brass & Bronze Co.,**
715 Spencer St.,
Toledo 9, Ohio. (317B)

**Burg Tool Manufacturing Co.,**
5028 W. Jefferson Ave.,
Los Angeles, Calif. (409)

**Carboloy Co., Inc.,**
Box 237 Roosevelt Park P. O.,
Detroit 32, Mich. (655)

**The Carborundum Co.,**
Niagara Falls, N. Y. (36)

**The Carlton Machine Tool Co.,**
Spring Grove Ave. & Meeker St.,
Cincinnati 25, Ohio (225)

**Century Electric Co.,**
1806 Pine St.,
Saint Louis 3, Mo. (36B)

**Chicago Drillet Corp.,**
1729 N. Winchester Ave.,
Chicago 22, Ill. (649)

**Chicago Rivet & Machine Co.,**
9600 West Jackson Blvd.,
Bellwood, Ill. (35G)

**The Chicago Screw Co.,**
1026 So. Homan Ave.,
Chicago 24, Ill. (425)

**Chicago Wheel & Manufacturing Co.,**
1101 West Monroe St.,
Chicago 7, Ill. (47C)

**The Cincinnati Bickford Tool Co.,**
3220 Forrer St.,
Cincinnati 9, Ohio. (514)

**The Cincinnati Gilbert Machine Tool Co.,**
3366 Beekman St.,
Cincinnati 23, Ohio. (413)

**Cincinnati Lathe & Tool Co.,**
North St.,
Cincinnati 9, Ohio. (522)

**The Cincinnati Milling Machine Co.,**
Cincinnati 9, Ohio. (306)

**The Cincinnati Planer Co.,**
3120 Forrer St.,
Cincinnati 9, Ohio. (220)

**The Cincinnati Shaper Co.,**
Hopple, Garrard & Elam St.,
Cincinnati 25, Ohio. (417)

**The Clark Controller Co.,**
1146 East 152nd St.,
Cleveland 10, Ohio (14A)

**Clearing Machine Corp.,**
6499 West 65th St.,
Chicago 38, Ill. (11)

**Cleereman Machine Tool Co.,**
400 West Madison St.,
Chicago 6, Ill. (123)

**The Cleveland Automatic Machine Co.,**
4932 Beech St.,
Cincinnati 12, Ohio (510)

**The Cleveland Hobbing Machine Co.,**
1311 Chardon Road,
Cleveland 17, Ohio (132A)

**The Cleveland Planer,**
3148 Superior Ave., N. E.,
Cleveland 14, Ohio. (428)

**Commander Manufacturing Co.,**
4225 West Kinzie St.,
Chicago 24, Ill. (328E)

**Cone Automatic Machine Co., Inc.,**
Windsor, Vermont. (617)

**Consolidated Machine Tool Corp.,**
565 Blossom Road,
Rochester 10, N. Y. (423)

**Covel Manufacturing Co.,**
Benton Harbor, Mich. (636)

**C. C. Craley Mfg. Co.,**
Shillington, Pa. (54C)

**The Cuno Engineering Corp.,**
Meriden, Conn. (157)

**The Cushman Chuck Co.,**
Hartford 2, Conn. (271)

**Cutler-Hammer, Inc.,**
315 N. 12th St.,
Milwaukee 1, Wis. (39A)

**Davenport Machine Tool Co., Inc.,**
167 Ames St.,
Rochester 1, N. Y. (531)

**Davis & Thompson Co.,**
6411 W. Burnham St.,
Milwaukee 14, Wis. (201)

**Dayton Rogers Mfg. Co.,**
2835 - 12th Ave. South,
Minneapolis 7, Minn. (14C)

**Dayton Rubber Mfg. Co.,**
Dayton 1, Ohio. (328G)

**Defiance Machine Works, Inc.,**
Perry and Third St.,
Defiance, Ohio. (118)

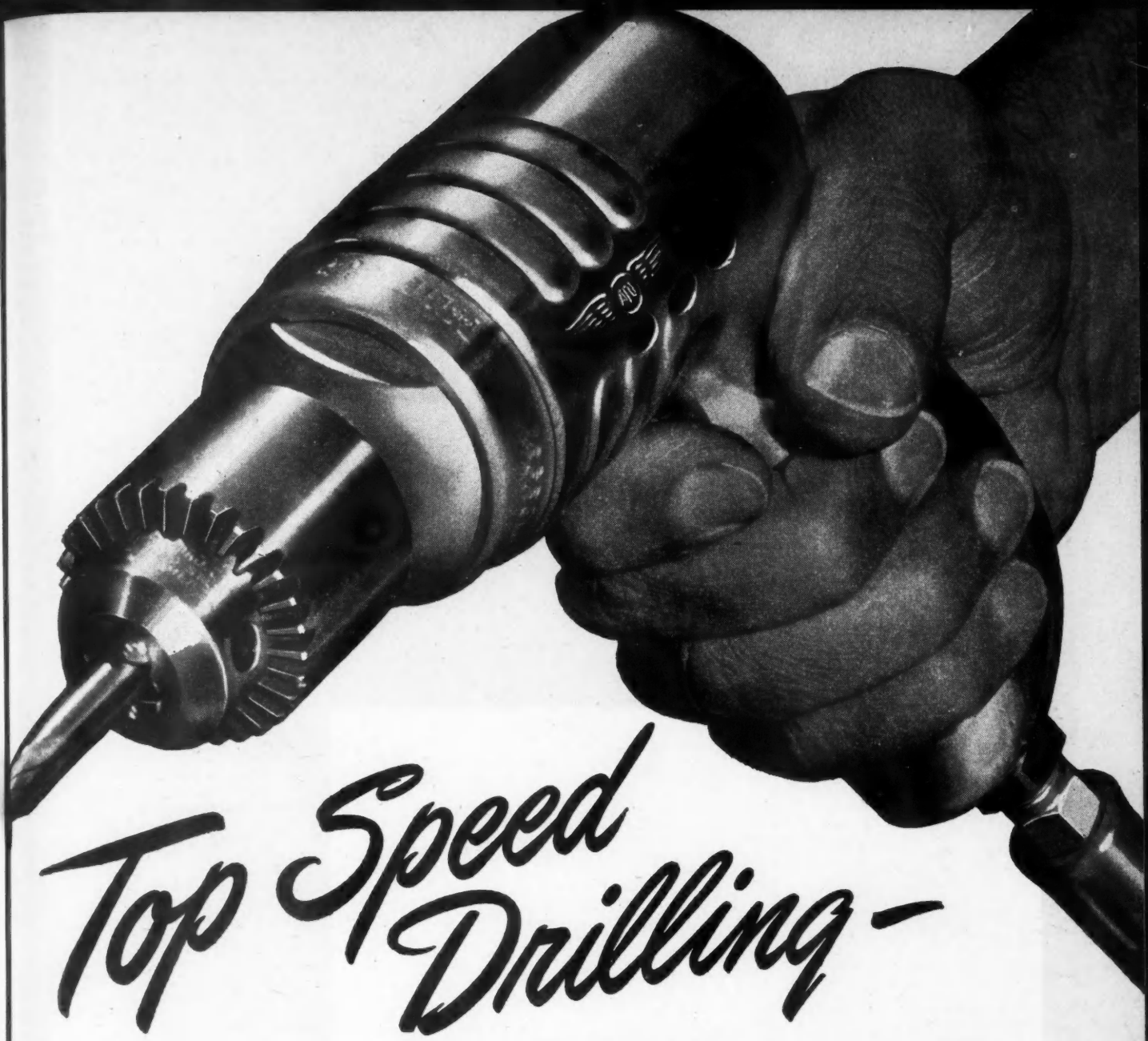
**The Denison Engineering Co.,**
Columbus 16, Ohio. (622)

**DeVlieg Machine Co.,**
450 Fair Ave.,
Detroit 20, Mich. (527)

**The DoAll Co.,**
254 North Laurel Ave.,
Des Plaines, Ill. (37)

**Dore Manufacturing Co., Inc.,**
Grayling, Mich. (34A)

*(Turn to page 126, please)*



# Top Speed Drilling—

**WITH LESS FATIGUE—LOWER COSTS!**

There's big power to do your drilling jobs *fast* . . . in the line of ARO Air Drills!

This speedy performer is Aro Model 109 for 3/16" or ¼" drilling in metal, plastic and wood. Exceptionally fast—rugged—dependable. 2,500 R. P. M. Light in weight . . . reduces operator fatigue. Precision-built for smooth operation and long life.

Do *all* your drilling, grinding, screw-driving, nut-setting and similar jobs with ARO Air Tools—you'll *save time* and *cut costs!* See your Aro Jobber. The Aro Equipment Corporation, Bryan, Ohio.

# ARO AIR TOOLS

# 1947 Machine Tool Show Exhibitors

(*Continued from page* 124)

**Dow Corning Corp.,**
Midland, Mich. (36A)
**The Eastern Machine Screw Corp.,**
Truman and Barclay Sts.,
New Haven 6, Conn. (160)
**Eclipse Counterbore Co.,**
1600 Bonner Ave.,
Ferndale 20, Mich. (603)
**Elgin National Watch Co.,**
Aurora, Ill. (35E)
**Enco Manufacturing,**
4522-24 W. Fullerton Ave.,
Chicago 39, Ill. (648)
**Engineers Specialties Div.,**
**Universal Engraving & Colorplate Co.,**
Buffalo 11, N. Y. (47E)
**Everede Tool Co.,**
2000 N. Parkside Ave.,
Chicago 39, Ill. (37B)
**Ex-Cello-O Corp.,**
1200 Oakman Boulevard,
Detroit 6, Mich. (518)
**The Fafnir Bearing Co.,**
Victory Square,
New Britain, Conn. (438)
**Fairbanks, Morse & Co.,**
600 South Michigan Ave.,
Chicago 5, Ill. (33A)
**Federal Electric Products Co.,**
50 Paris Street,
Newark 5, N. J. (446)
**Federal Products Corp.,**
1144 Eddy St.,
Providence 1, R. I. (47)
**The Fellows Gear Shaper Co.,**
Springfield, Vermont (107)
**The Felters Co., Unisorb Div.,**
210 South Street,
Boston 11, Mass. (35D)
**Fitchburg Engineering Corp.,**
Oak Hill Road,
Fitchburg, Mass. (412)
**Fitchburg Grinding Machine Corp.,**
Falulah Road,
Fitchburg, Mass. (564)
**The Foote-Burt Co.,**
13000 St. Clair Ave.,
Cleveland 8, Ohio. (51)
**The Fosdick Machine Tool Co.,**
Blue Rock and Apple Sts.,
Cincinnati 23, Ohio. (15)
**Furnas Electric Co.,**
300 McKee St.,
Batavia, Ill. (33C)
**Gallmeyer & Livingston Co.,**
Grand Rapids 4, Mich. (230)
**Gardner Machine Co.,**
Beloit, Wisc. (429)
**Gay-Lee Co.,**
2000 E. 9 Mile Road,
Ferndale 20, Mich. (302B)
**Gear Grinding Machine Co.,**
3901 Christopher Ave.,
Detroit 11, Mich. (670)
**General Electric Co.,**
1 River Road,
Schenectady 5, N. Y. (240)
**General Machinery Corp.,**
Niles Tool Works Division,
Hamilton, Ohio. (110)
**Geometric Tool Co.,**
Blake and Valley St.,
New Haven 15, Conn. (50)
**Giddings & Lewis Machine Tool Co.,**
Fond du Lac, Wisc. (315)
**Gisholt Machine Co.,**
1245 East Washington Ave.,
Madison 3, Wisc. (304)
**Gits Bros. Mfg. Co.,**
1846 S. Kilbourn Ave.,
Chicago 23, Ill. (405)
**Gleason Works,**
1000 University Ave.,
Rochester 3, N. Y. (330)
**Goddard & Goddard,**
12280 Burt Road,
Detroit 23, Mich. (605)
**George Gorton Machine Co.,**
1321 Racine St.,
Racine, Wis. (2)
**The Goss & DeLeeuw Machine Co.,**
Kensington, Conn. (421)
**Gould & Eberhardt, Inc.,**
433 Fabyan Place,
Irvington 11, N. J. (41)
**The G. A. Gray Co.,**
3611 Woodburn Ave.,
Cincinnati 7, Ohio. (501)
**Greenlee Bros. & Co.,**
2100-2400 Twelfth St.,
Rockford, Ill. (53)
**The Hall Planetary Co.,**
Fox Street & Abbotsford Ave.,
Philadelphia 29, Pa. (141)
**Hanchett Manufacturing Co.,**
906 North State St.,
Big Rapids, Mich. (612)
**Hannifin Corp.,**
1101 S. Kilbourn Ave.,
Chicago 24, Ill. (411)
**The Hanson-Whitney Machine Co.,**
Hartford 1, Conn. (441)
**Hardinge Brothers, Inc.,**
Elmira, N. Y. (45)
**R. G. Haskins Co.,**
2651 W. Harrison St.,
Chicago 12, Ill. (675)
**The Heald Machine Co.,**
10 New Bond St.,
Worcester 6, Mass. (511)
**The Hendey Machine Co.,**
Torrington, Conn. (105)
**The Henry & Wright Manufacturing Co.,**
760 Windsor St.,
Hartford 1, Conn. (131)
**The Holo-Krome Screw Corp.,**
Hartford 10, Conn. (33D)
**E. F. Houghton & Co.,**
303 West Lehigh Ave.,
Philadelphia 33, Pa. (47D)
**Hyatt Bearings Div.,**
**General Motors Corp.,**
Harrison, N. J. (433)
**Hydraulic Press Manufacturing Co.,**
Mount Gilead, Ohio (625)
**Hy-Level Screw Products Co.,**
2114 West Superior Ave.,
Cleveland 13, Ohio (328C)
**Ideal Industries, Inc.,**
Sycamore, Ill. (448)
**Illinois Gage Co.,**
7810 West Addison St.,
Chicago 34, Ill. (35H)
**Illinois Tool Works,**
2501 N. Keeler Ave.,
Chicago 39, Ill. (302)
**Independent Pneumatic Tool Co.,**
600 W. Jackson Blvd.,
Chicago 6, Ill. (404)
**The Ingersoll Milling Machine Co.,**
Douglas Street & Willoughby Ave.,
Rockford, Ill. (58)
**IRON AGE,**
100 E. 42nd St.,
New York 17, N. Y. (317A)
**Jacobs Manufacturing Co.,**
Hartford 2, Conn. (504)
**The Chas. L. Jarvis Co.,**
Middletown, Conn. (313C)
**Johnson Bronze Co.,**
South Mill St.,
New Castle, Pa. (145)
**Jones & Lamson Machine Co.,**
Springfield, Vermont (326)
**Kaukauna Machine Corp.,**
1000 Lincoln Ave.,
Kaukauna, Wisc. (117)
**Kearney & Trecker Corp.,**
6784 West National Ave.,
Milwaukee 14, Wisc. (301)
**Kennametal, Inc.,**
Latrobe, Pa. (570)
**Kent-Owens Machine Co.,**
958 Wall St.,
Toledo 10, Ohio. (432)
**King Machine Tool Co.,**
Tennessee & Paddock Road,
Cincinnati 29, Ohio (502)
**Kingsbury Machine Tool Corp.,**
Keene, N. H. (410)
**W. B. Knight Machinery Co.,**
3920 West Pine Boulevard,
St. Louis 8, Mo. (151)
**Kropp Forge Co.,**
5301 W. Roosevelt Road,
Chicago 50, Ill. (122)
**Landis Machine Co.,**
Church & Fifth St.,
Waynesboro, Pa. (101)
**Landis Tool Co.,**
Sixth and Ringgold Sts.,
Waynesboro, Pa. (303)
**Langelier Manufacturing Co.,**
Providence 7, R. I. (434)
**Lansing Engineering Co.,**
735 East Kalamazoo St.,
Lansing 12, Mich. (35C)
**The Lapointe Machine Tool Co.,**
Hudson, Mass. (642)
**LaSalle Steel Co.,**
Chicago 80, Ill. (14D)
**The R. K. LeBlond Machine Tool Co.,**
Madison and Edwards Roads,
Cincinnati 8, Ohio (507)
**The Lee-Bradner Co.,**
12120 Elmwood Ave.,
Cleveland 11, Ohio (111)
**Lehmann Machine Co.,**
3560 Chouteau Ave.,
St. Louis 3, Mo. (268)
**Leland-Gifford Co.,**
1001 Southbridge St.,
Worcester 1, Mass. (308)
**Lempco Products, Inc.,**
Dunham Road,
Bedford, Ohio (503)
**Liberty Planers, Inc.,**
1000 Weller Ave.,
Hamilton, Ohio (415)
**Lift Trucks, Inc.,**
2425 Spring Grove Ave.,
Cincinnati 14, Ohio (35B)
**Link-Belt Co.,**
307 North Michigan Ave.,
Chicago 1, Ill. (652)
**Lipe-Rollway Corp.,**
Syracuse 1, N. Y. (403)
**Lodge & Shipley Co.,**
3055-3065 Colerain Ave.,
Cincinnati 25, Ohio (312)
**Logansport Machine Co., Inc.,**
Logansport, Ind. (113)
**Lovejoy Tool Co., Inc.,**
Springfield, Vt. (153)
**Lucas Machine Tool Co.,**
12302 Kirby Road,
Cleveland 8, Ohio (39)
**The Lufkin Rule Co.,**
Saginaw, Mich. (302A)
**Macklin Co.,**
Jackson, Mich. (328D)
**Madison-Kipp Corp.,**
201 Waubesa St.,
Madison 4, Wis. (450)
**Mall Tool Co.,**
7740 South Chicago Ave.,
Chicago 19, Ill. (35A)
**Marlin-Rockwell Corp.,**
402 Chandler St.,
Jamestown, N. Y. (156)
**The Master Manufacturing Company,**
1300 East Ave. A,
Hutchinson, Kan. (328H)
**Mateo Tool Co.,**
2830 W. Lake St.,
Chicago 12, Ill. (14B)
**Mattison Machine Works,**
Blackhawk Park Ave.,
Rockford, Ill. (46)
**McGill Manufacturing Co., Inc.,**
Valparaiso, Ind. (549)
**Merz Engineering Co.,**
200 S. Harding St.,
Indianapolis 7, Ind. (33F)
**Michigan Tool Co.,**
7171 E. McNichols Road,
Detroit 12, Mich. (426)

(*Turn to page* 128, *please*)

# POWER

## EXIDE BATTERIES PUT EXTRA POWER IN DIESEL ENGINE CRANKING

The dependable cranking power of Exide Batteries is being demonstrated daily on many types of Diesel engines, operating under all conditions and in all climates.

Exide Batteries are cranking Diesel engines on trucks, buses and off-the-highway equipment, on ships and railway locomotives and in power plants. They have the high capacity needed to provide the extra speed that Diesel cranking requires. Their rugged construction keeps them on the job day after day. And wherever used, Exide Batteries continue to prove their dependability, long life and ease of maintenance.

Write today for a FREE copy of the Exide Catalog on Heavy-Duty Batteries. It gives you catalog data and information on how to get the most from your Diesel Cranking Batteries.

**Exide**
**BATTERIES**

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

# Tool Show Exhibitors

(*Continued from page* 126)

**Micromatic Hone Corp.,**
8100 Schoolcraft Ave.,
Detroit 4, Mich. (323)

**Moline Tool Co.,**
102 Twentieth St.,
Moline, Ill. (128)

**The Monarch Machine Tool Co.,**
Sidney, Ohio (208)

**Morton Manufacturing Co.,**
Broadway and Hoyt,
Muskegon Heights, Mich. (120)

**Nathan Manufacturing Co.,**
416 East 106th St.,
New York 29, N. Y. (658)

**The National Acme Co.,**
170 E. 131st St.,
Cleveland 8, Ohio (628)

**National Automatic Tool Co., Inc.,**
So. 7th and N Sts.,
Richmond, Ind. (4)

**National Broach & Machine Co.,**
5600 St. Jean Ave.,
Detroit 13, Mich. (607)

**The National Machinery Co.,**
Greenfield & Stanton Sts.,
Tiffin, Ohio (17)

**New Britain-Gridley Machine Div.,**
The New Britain Machine Co.,
New Britain, Conn. (311)

**New Departure Div.,**
General Motors Sales Corp.,
Bristol, Conn. (604)

**C. A. Norgren Co.,**
222 Santa Fe Drive,
Denver 9, Colo. (37A)

**Norma-Hoffman Bearings Corp.,**
Hamilton Ave.,
Stamford, Conn. (313A)

**Norton Co.,**
1 New Bond St.,
Worcester 6, Mass. (5)

**Oakite Products, Inc.,**
22 Thames St.,
New York 6, N. Y. (317G)

**The Oilgear Co.,**
1403 West Bruce St.,
Milwaukee 4, Wis. (440)

**O. K. Tool Co.,**
33 Hull St.,
Shelton, Conn. (650)

**Oliver Instrument Company,**
Adrian, Mich. (435)

**O'Neil-Irwin Mfg. Co.,**
Lake City, Minn. (13A)

**Orlandi Gear and Machine Co.,**
16195 Meyers Road,
Detroit 27, Mich. (37D)

**The Oster Manufacturing Co.,**
2057 East 61st Place,
Cleveland 3, Ohio (634)

**Owens-Corning Fiberglas Corp.,**
Toledo 1, Ohio (445)

**The Parker Appliance Co.,**
17325 Euclid Ave.,
Cleveland 12, Ohio (302D)

**Parker-Kalon Corp.,**
200 Varick St.,
New York 14, N. Y. (243A)

**Peerless Machine Co.,**
1600 Junction Ave.,
Racine, Wis. (144)

**Physicists Research Co.,**
321 South Main St.,
Ann Arbor, Mich. (563)

**Pines Engineering Co., Inc.,**
601 Walnut St.,
Aurora, Ill. (18)

**Pioneer Pump & Mfg. Co.,**
19679 John R. St.,
Detroit 3, Mich. (35F)

**Plan-O-Mill Corp.,**
1511 E. Eight Mile Road,
Hazel Park, Mich. (408)

**Portman Machine Tool Co., Inc.,**
70 Portman Road,
New Rochelle, N. Y. (442)

**Potter & Johnston Machine Co.,**
1027 Newport Ave.,
Pawtucket, R. I. (43)

**Pratt & Whitney,**
Division Niles-Bement-Pond Co.,
West Hartford 1, Conn. (55)

**Precise Products Co.,**
1328-30 Clark St.,
Racine, Wis. (37C)

**Purolator Products, Inc.,**
744 Broad St.,
Newark 2, N. J. (328B)

**Racine Tool & Machine Co.,**
1760 State St.,
Racine, Wis. (443)

**R & D Toolholder Co., Inc.,**
62 Ryle Ave.,
Paterson 2, N. J. (657)

**Reed-Prentice Corp.,**
677 Cambridge St.,
Worcester 4, Mass. (40)

**Reeves Pulley Co.,**
Columbus, Ind. (317F)

**Rehnberg-Jacobson Mfg. Co.,**
2135 Kishwaukee St.,
Rockford, Ill. (233)

**Reid Brothers Co., Inc.,**
138-140 Elliott St.,
Beverly, Mass. (456)

**Reliance Electric and Engineering Co.,**
1088 Ivanhoe Road,
Cleveland 10, Ohio (302C)

**Republic Drill & Tool Co.,**
322 South Green St.,
Chicago 7, Ill. (317C)

**Rivett Lathe & Grinder, Inc.,**
18 Riverview Road,
Brighton 35, Mass. (28)

**Rockford Machine Tool Co.,**
2400 Kishwaukee St.,
Rockford, Ill. (526)

**Rodgers Hydraulic, Inc.,**
St. Louis Park,
Minneapolis 16, Minn. (641)

**Roller Bearing Co. of America,**
Whitehead Road,
Trenton, N. J. (13B)

**Ross Operating Valve Co.,**
6488 Epworth Blvd.,
Detroit 10, Mich. (313B)

**Royal Oak Tool & Machine Co.,**
621 E. Fourth St.,
Royal Oak, Mich. (34C)

**George Scherr Co., Inc.,**
200 Lafayette St.,
New York 12, N. Y. (663)

**Geo. E. Schmidt, Inc.,**
4100 Ravenswood Ave.,
Chicago 13, Ill. (647)

**Seneca Falls Machine Co.,**
Seneca Falls, N. Y. (3)

**Severance Tool Industries, Inc.,**
Saginaw, Mich. (33B)

**The Sheffield Corp.,**
Dayton 1, Ohio (202)

**Sidney Machine Tool Co.,**
Sidney, Ohio (16)

**Size Control Co.,**
Div. American Machine & Gage Co.,
2500 West Washington Blvd.,
Chicago 12, Ill. (401)

**SKF Industries, Inc.,**
Philadelphia 32, Pa. (666)

**Skinner Chuck Co.,**
344 Church St.,
New Britain, Conn. (638)

**Smith & Mills Co.,**
2889 Spring Grove Ave.,
Cincinnati 25, Ohio (665)

**Socony-Vacuum Oil Co., Inc.,**
26 Broadway,
New York 4, N. Y. (33)

**The Springfield Machine Tool Co.,**
Springfield, Ohio (436)

**Square D Co., Ind. Controller Div.,**
4041 N. Richards St.,
Milwaukee 12, Wis. (678)

**Standard Oil Co. (Indiana),**
910 South Michigan Ave.,
Chicago 80, Ill. (40B)

**The Staples Tool Co.,**
2851 Massachusetts Ave.,
Cincinnati 25, Ohio (47F)

**L. S. Starrett Co.,**
Crescent St.,
Athol, Mass. (200)

**Stearns Magnetic Manufacturing Co.,**
635 South 28th St.,
Milwaukee 4, Wis. (677)

**Sterling Bolt Co.,**
209 West Jackson Blvd.,
Chicago 6, Ill. (54A)

**D. A. Stuart Oil Co., Ltd.,**
2727 South Troy St.,
Chicago 23, Ill. (317L)

**Sundstrand Machine Tool Co.,**
Hydraulic Div.,
2531 Eleventh St.,
Rockford, Ill. (20)

**Sun Oil Co.,**
1608 Walnut St.,
Philadelphia 3, Pa. (644)

**Super Tool Co.,**
21650 Hoover Road,
Detroit 13, Mich. (676)

**Synthane Corporation,**
Oaks, Pa. (34B)

**The Taft-Peirce Mfg. Co.,**
Woonsocket, R. I. (601)

**The Taylor & Fenn Co.,**
54 Arch St.,
Hartford 1, Conn. (623)

**The Texas Co.,**
135 East 42nd St.,
New York 17, N. Y. (13C)

**Thomas Hoist Co.,**
20 So. Hoyne Ave.,
Chicago 12, Ill. (33DD)

**The Thompson Grinder Co.,**
Springfield, Ohio (114)

**Threadwell Tap & Die Div.,**
Sheffield Corp.,
Springfield St.,
Dayton 1, Ohio (444)

**The Timken Roller Bearing Co.,**
1835 Dueber Ave., S.W.,
Canton 6, Ohio (317D)

**Twin Disc Clutch Co.,**
1328 Racine St.,
Racine, Wis. (453)

**Union Manufacturing Co.,**
New Britain, Conn. (125)

**U. S. Electrical Motors, Inc.,**
200 East Slauson Ave.,
Los Angeles 54, Calif. (34)

**U. S. Tool Co., Inc.,**
255 North 18th St.,
Ampere, East Orange, N. J. (236)

**Universal Boring Machine Co.,**
312 Main St.,
Hudson, Mass. (619)

**The V & O Press Co.,**
Division of Rockwell Mfg. Co.,
Hudson, N. Y. (150)

**Van Norman Co.,**
3640 Main St.,
Springfield 7, Mass. (9)

**Vascoloy-Ramet Corp.,**
North Chicago, Ill. (317J)

**Veeder-Root, Inc.,**
Hartford, Conn. (402)

**Vickers Inc.,**
1400 Oakman Blvd., Detroit 32, Mich. (228)

**Vinco Corp.,**
8855 Schaefer Highway,
Detroit 27, Mich. (224)

**Wallace Supplies Mfg. Co.,**
1310-12 Diversey Parkway,
Chicago 14, Ill. (154)

**The Warner & Swasey Co.,**
5701 Carnegie Ave.,
Cleveland 3, Ohio (309)

**Warner Electric Brake Mfg. Co.,**
Beloit, Wis. (328A)

**Weddell Tools, Inc.,**
37 Centennial St.,
Rochester 11, N. Y. (483)

**Westinghouse Electric Corp.,**
511 Wood St.,
Pittsburgh 30, Pa. (451)

**Wiedemann Machine Co.,**
1815 Sedgley Ave.,
Philadelphia, Pa. (32)

**Wilson Mechanical Instrument Co.,**
230 Park Ave.,
New York 17, N. Y. (452)

**Wilton Tool Manufacturing Co.,**
936 Wrightwood Ave.,
Chicago 14, Ill. (355)

**Yale & Towne Manufacturing Co.,**
4530 Tacony St.,
Philadelphia 24, Pa. (121)

# Seven Meetings Scheduled for Machine Tool Congress

IN conjunction with the 1947 Machine Tool Show, Sept. 17-26, at Chicago, Machine Tool Congress will be held in that city under the sponsorship of the National Machine Tool Builders' Association and seven other organizations, which have arranged special programs for their respective meetings. The programs have been announced as follows:

### American Machine Tool Distributors' Association

Sept. 17 at Hotel La Salle—Dinner, 7:00 pm; Meeting 8:15 pm.

Presiding: George Habicht, Jr., president of the Association and President, Marshall & Huschart Machinery Co.

Presentation of certificates of honorary memberships to: William F. McCarthy, J. Roy Porter, J. W. Wright, John Sauer, Jr.

Opening Remarks: K. H. Hobbie, President of the Machine Tool Congress and Vice President, Driver-Harris Co.; Herbert H. Pease, President, National Machine Tool Builders' Association, and President, New Britain Machine Co.

"Democracy with a gun in her ribs," Fulton Lewis, Jr., News Commentator.

### American Society of Mechanical Engineers

Sept. 18 at Continental Hotel—Dinner, 6:30 pm; Meeting, 8:00 pm.

Presiding: W. G. Miller, Manager, Headquarters Manufacturing Dept., Westinghouse Electric Corp.

Recorder: Edgar D. Vancil, manager, Engineering, Cincinnati Milling Machine Co.

"FORM GRINDING," J. I. Wilson, Thompson Grinder Co.

"FABRICATED CONSTRUCTION IN MACHINE TOOLS," J. F. Lincoln, President, Lincoln Electric Co.

### American Society of Tool Engineers and American Foundrymen's Association

Sept. 19 at Hotel Sherman—Dinner, 6:30 pm; Meeting, 8: pm.

Presiding: F. J. Schmitt, Director of Sales, D. A. Stuart Oil Co., Ltd.

"Turning Points in the Metalworking Industry," Myron S. Curtis, Assistant-Director of Engineering, Warner & Swasey Co.

"When and How to Use Cast Iron," T. E. Eagan, Chief Metallurgist, Cooper-Bessemer Corp., and Past Chairman, Gray Iron Division American Foundrymen's Association.

### National Elecerical Manufacturers Association

Sept. 22 at Palmer House—8:30 pm.

Presiding: R. Stafford Edwards, President of the Association, and President, Edwards & Co.

"Mass Production and the Tool Industry," Charles F. Kettering, Research Consultant, General Motors Corp.

### Chicago Technical Societies Council

Sept. 23 at Civic Opera Bldg.—Dinner 6:30 pm, Meeting 8:00 pm.

Presiding: Gustav Egloff, President of the Council, and Director of Research Universal Oil Products Co.

A Message of Welcome: Kenneth H. Hobbie, President of the Machine Tool Congress, Past President of the Council, and Vice President, Driver-Harris Co.

"Machine Tools and the Philosophy of Production," George Habicht, Jr. Presi-

(*Turn to page* 168, *please*)

*For* **HOT FORGING**
**FORMING**
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This 2,000-ton self-contained HYDROLECTRIC Forming Press can do a big job for Hot Die-Forging or Forming . . . and do it well, automatically. Standard equipment contains a centralized control system, fully automatic, semi-automatic or manual operation . . . just by setting the selector switch. A special die-setting control available, providing sensitive platen movement. For more details, or engineering advice, ask R. D. Wood Company, Public Ledger Building, Independence Square, Philadelphia 5, Pa.

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EST. 1803

# War Department Plans Reserve Service Units within Industry

BARELY recovered from the effects of World War II, American industry has already been called upon to play a major part in present plans for creation of a large pool of reserve service units, ready for immediate mobilization, should this nation again suddenly find itself at war. Reserve service troops will be provided by industry in the form of units organized in specific plants ready for instant action with all equipment required by their respective trades.

Speaking in Chicago last fall, President Truman reminded the nation that "if there must be a next time, we are likely to be the first target and so, on short notice, each man must be ready to take his place and go forward—not at the end of a few months or a few years, but immediately."

It is also generally assumed that any future war will not only be undeclared prior to attack but will begin with a surprise raid—not on an outpost, as in the case of Pearl Harbor—but on key points on the continent itself. It is on this basis that the War Department is building its program for organization of upwards of 2500 service units within industry as part of the nation's military reserve.

No authority will go so far as to predict where the enemy would choose to strike first, should such attack be made against the United States. However, military sources admit that successfully staked raids, either simultaneously or in quick succession, against the six cities of St. Louis, Chicago, Detroit, Cleveland, Pittsburgh, and Washington could amount to a major disaster. In one swoop, a paralyzing blow would be dealt to six of the more impartant centers affecting communications, transportation and manufacturing.

The Army's industrial reserve plan has been laid down for the purpose of minimizing and making the quickest possible recovery from the effects of such attacks, should they ever occur. Through this blueprint for action, trained service type units would be ready for instant mobilization, ready for assignment by Army commanders to regious where the regular and reserve tactical units need them most, for the restoration of industrial and other facilities, as well as for performing the usual supply functions. Also, still others could move into unharmed industrial areas to direct the activation of standby plants and conversion of others to war production in the fastest possible time.

The Affiliatel Units, as the industrial reserve group, are called, will hold exactly the same status as the Organized Reserve—of which they are actually a part and parcel. While reservists voluntarily obligate themselves to serve in the military forces when needed, unlike the National Guard, the reserves are not called out for active duty until the President proclaims a national emergency or Congress declared war.

Normally, from 15 to 20 service personnel are required to support each man in actual combat; more than 20,000 active units were serving on VJ-Day. In future conflicts, the ratio conceivably could be higher. Obviously, the peacetime Regular Army and National Guard cannot include in their peacetime setup sufficient service type units to provide necessary support in the event of sudden mobilization. It is the Organized Reserves to which the military forces must look for such units.

Through organization and training of

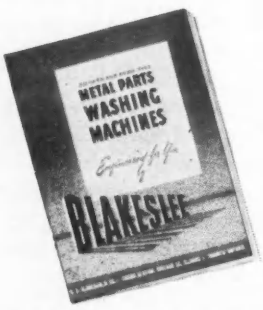
(*Turn to page* 148, *please*)

PAINT REALLY STICKS

WHEN METAL PARTS ARE THOROUGHLY CLEANED IN A

BLAKESLEE

METAL PARTS WASHER

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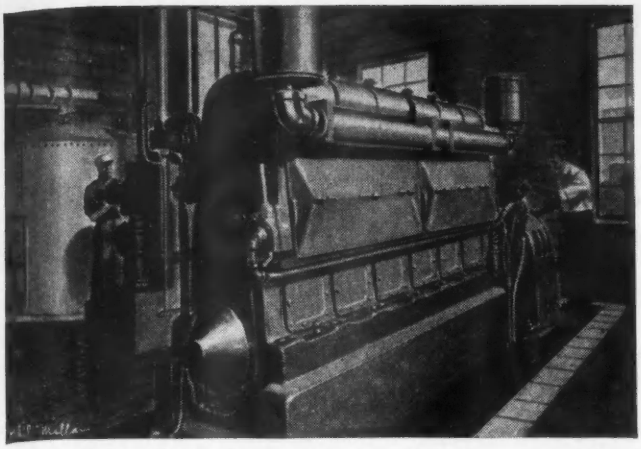

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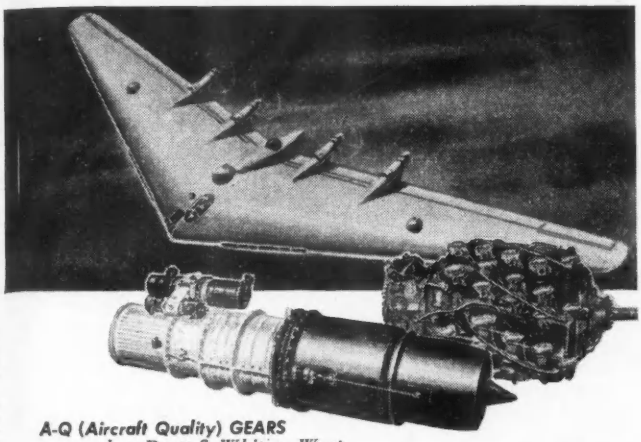
**ACTUATORS AND POWER UNITS** *assure control from a remote point. Used on many of the most modern airplanes they may aid in solving your control problems.*



**A-Q (Aircraft Quality) GEARS**
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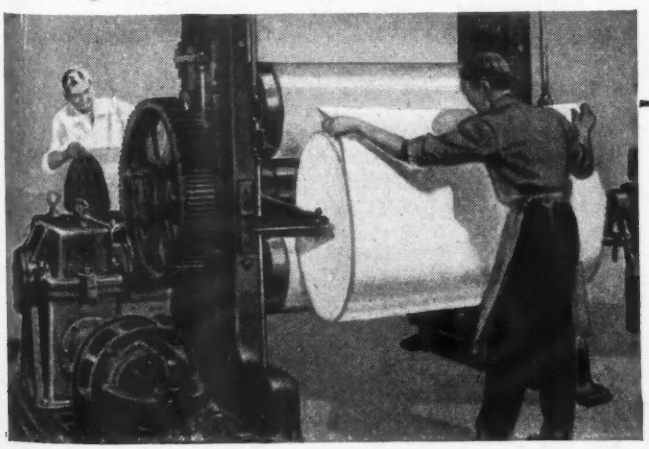

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It may be "A-Q" (aircraft quality) gears for use in applications where the characteristics of high speed, greater compactness, light weight, high efficiency, and low noise level are important. *Foote Bros. A-Q gears closely approach theoretical perfection.*

It may be accessory drives on jet propulsion engines, actuators to provide exact control of linear or rotary motion from a remote point. *Foote Bros. actuators and power units are serving on many of the nation's revolutionary aircraft engines and airplanes.*

It may be speed reducers for a paper mill, a steel plant, a chemical plant or any other industrial application. *Foote Bros. makes reducers in a wide range of sizes and ratios to meet your requirements.*

To manufacturers, Foote Bros. offers two completely equipped plants—nearly a century of manufacturing experience—a thoroughly staffed engineering department to assist in the design and application of equipment to meet any power transmission problem.

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*City*.....*State*.....

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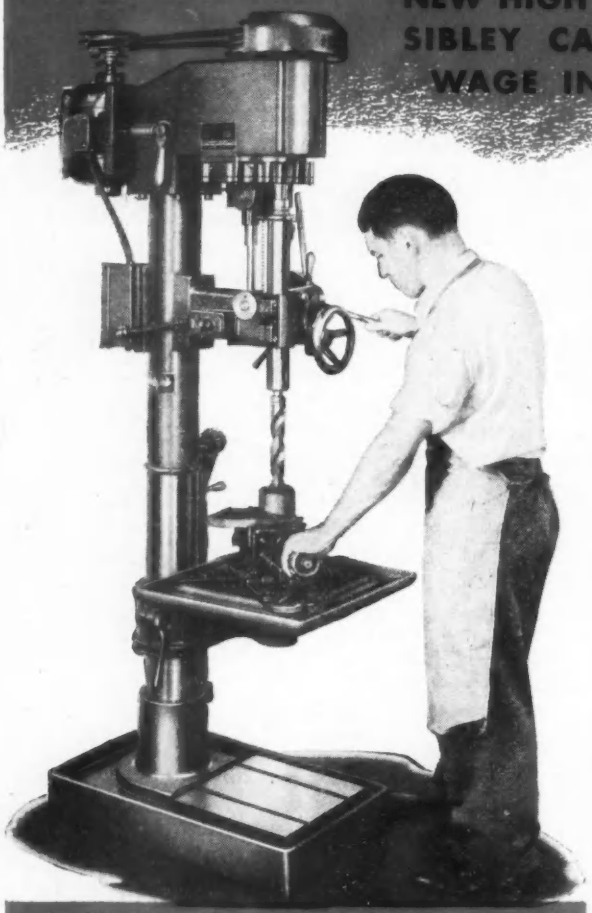
Time and Motion Study

..... IF NOT—YOU'LL SOON DISCOVER HOW THE NEW HIGH SPEED C-20 SIBLEY CAN ABSORB WAGE INCREASES!



You say—Only by more output can costs be cut!

All right—compare T. & M. studies on your present equipment with this new 20" Sibley drilling and tapping machine. We can tell you *now* the difference will surprise you!

Here is a shop machine designed by shop men. You have easy access to controls—turn a knob to select the proper geared power feed. A lever allows convenient shifting of V-belt. This Sibley is a precision tool for sensitive drilling at high speeds, but has ample power to drill 1½" in mild steel. 8 speeds range from 65 to 1360 RPM, driven by a 2 H.P. motor.

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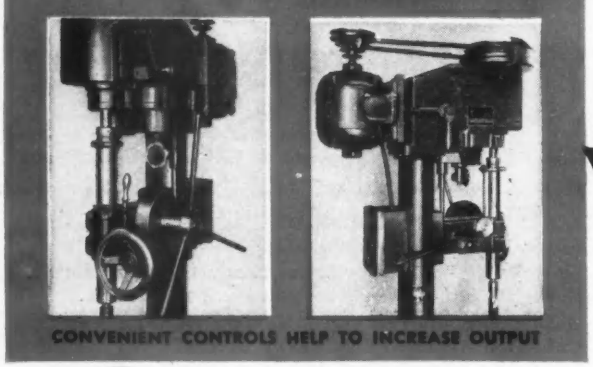
Get complete details to compare with present equipment.



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SIBLEY MACHINE & FOUNDRY CORP.
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# Service Units Within Industry

(*Continued from page* 146)

such units in peacetime, the time element for mobilization is short-cut by elimination of the period normally required for recruiting-drafting, screening of thousands of men for skills and aptitudes, and training them for organized field operations. These necessary steps have not only been time-consuming in the past but inevitably resulted in many square pegs being fitted into round holes.

Members of Affiliated Units will normally be drawn from the employe ranks of the sponsoring organization (firm or company) although a sponsor may "adopt" a unit already organized, for instance, where a number of the proposed sponsor's employes are already members of a unit of the Organized Reserve. These units would be given training in adapting the lines of work with which they are most familiar to military purposes.

The War Department warns against a sponsor mobilizing himself out of business—in other words, drawing on his working force for unit personnel to such an extent that his operations would be crippled in the event of the unit or units being called to active duty. A sponsor may draw on outside sources for filler personnel, it is pointed out.

Generally speaking, many of the Affiliated Units formed within the automotive, aircraft and allied industries would be assigned to the Ordnance Department and Air Forces for supply, repair and maintenance duty. More specifically, these industries will be asked to organize one or more of any of the following type units: Ordnance Maintenance Units for armored divisions and heavy artillery, Ordnance Shop units, Depot Groups, Service Groups, Air and Ordnance Repair groups, Air Engineer squadrons, Air and Ordnance Material groups, Air Supply squadrons, Air and Ordnance Utility units, etc.

By the same token, trucking and motor bus systems would be largely organized into Transportation Corps units for keeping troops and supplies on the move. In fact, this type of organization was utilized in a limited way in the recent war when various groups in the automotive field sponsored a number of Ordnance Maintenance, Repair and similar companies. Their successful operational record has had a heavy bearing on the decision to create the present industrial reserve.

As to how these plans would work out in the event of an emergency, the highly industrialized city of Pittsburgh—served by air, water, rail and motor transportation—might well be taken as a hypothetical example. Should this city be attacked suddenly (bombed), Regular Army troops and the National Guard, as well as Pennsylvania's 79th

(*Turn to page* 150, *please*)

It's sooner than you think...
THE SATURDAY EVENING POST
...when you may step out of an aluminum house...
...to commute on an aluminum bus...
...to work in an aluminum office building...
...then home to raise on aluminum furniture...
...or work in the yard with aluminum tools!
More and better aluminum products—today...with
Kaiser Aluminum
a Permanente Metals product

# What things do you think of when we say "aluminum"?

When asked that question in a recent survey, 92% of the people interviewed replied: "Pots and pans."

On the other hand, *less than* 4% mentioned such aluminum "naturals" as roofing and siding, heating and ventilating equipment, gutters and down-spouts, busses, garage doors, garden tools, home-trailers.

What does this mean?

**Simply that while aluminum has proved itself the successor of other metals in hundreds of applications ... public awareness has largely remained at the pot-and-pan level.**

And without awareness, how can there be *demand?*

To increase consumer awareness of aluminum products ... to interpret them in terms of *better living* and thus create demand ... is the objective of the above advertisement and the many that will follow.

They will appear, in full color, in such top-read magazines as Saturday Evening Post, Newsweek, Collier's, Time, Sunset, reaching a total audience of over 30 million every month! Such advertising, we believe, is bound to influence the buying habits of a big share of this audience.

Which will mean a lot more business for the makers of aluminum products.

**Ready to serve you—*today*...**

# Kaiser Aluminum

**a Permanente Metals product**

DISTRIBUTED BY PERMANENTE PRODUCTS COMPANY, KAISER BLDG., OAKLAND, CALIFORNIA . . . WITH OFFICES IN:

Seattle, Wash. Oakland, Calif. Los Angeles, Calif. Dallas, Texas Wichita, Kan. Kansas City, Mo. St. Louis, Mo. Atlanta, Ga. Minneapolis, Minn. Milwaukee, Wis. Chicago, Ill. Cincinnati, Ohio Cleveland, Ohio Detroit, Mich. Boston, Mass. Hartford, Conn. Buffalo, N. Y. New York City, N. Y. Philadelphia, Penn. Washington, D. C.

# Service Units within Industry

(*Continued from page* 148)

Infantry Division (ORC), would be called to the scene. However, the number of service units normally attached to these troops would be far too small for the job of digging out. But the commander of the Second Army would be able to draw on the industrial reserves (Affiliated Units) for sufficient units to repair bridges and industrial facilities, restore rail, highway and water transportation, open up wire and radio communication, and otherwise perform needed support duty for the tactical troops patrolling or defending the area.

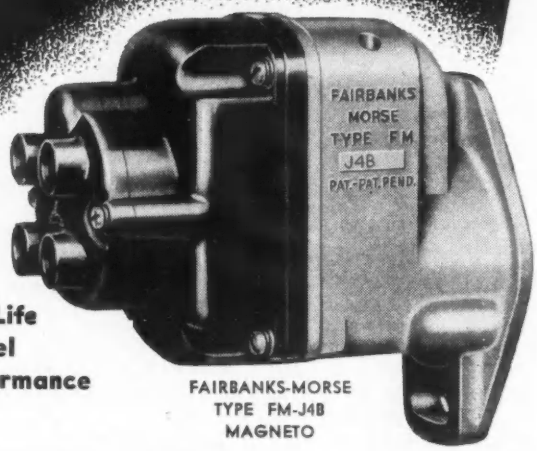
The commanding officer of an Affiliated Unit will be a reserve officer, equally acceptable to the sponsor and the War Department. Other officer vacancies may be filled from rosters of the Organized Reserves or personnel from the sponsoring firm or organization who may obtain reserve commissions under certain conditions. Some units, of course, may not have a full officer-enlisted man complement; provisions have also been made to assign filler personnel from either the selective service or organized reserves should mobilization be necessary.

Three types of units—A, B, and C—are provided. Class A units are those assigned to a full complement of officers and enlisted men; Class B is organized with a full officer strength and a cadre of key enlisted men, while Class C units would have a full complement of officers only. Classes B and C would draw filler strength from selective service or bulk reserve personnel should they be called for active duty.

Since the purpose of these industrial reserves is to provide effective operating units for immediate mobilization, training schedules are provided just as for the National Guard and other Organized Reserves. Sponsors may choose one of several training plans—the one which appears to interfere least with normal civilian activity. These range from weekly to quarterly training sessions; some if selected also require a 15-day summer field training. Necessary clothing and equipment will be provided by the War Department.

Industrial units may be terminated as military reserves upon written notice by the sponsor; likewise, personnel may resign individually upon presentation of a resonable cause. And, of course, the War Department may cancel the service of either the unit or individual reservists for good cause.

YES—
This Magneto
Does More for
Engines!

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"SUPER-SPARK" MAGNETO

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- Boosts Efficiency
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- Saves Time, Money, Fuel
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Fairbanks-Morse "Super-Spark" Magnetos are simple in design, sound in construction—economical and easy to install, profitable to use. Made with minimum moving parts to wear sealed against dust and moisture.

Products of 117 years of manufacturing experience, they're available in a complete range of sizes and types to fit all tractor and other engines. For full particulars, write today to Fairbanks, Morse & Co., Magneto Division, Beloit, Wisconsin.

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## Vote Henry Ford II As "Man of Year"

Henry Ford II has been named "man of the year" by the N. Y. Financial Writers Association. He was afforded the distinction of being "the man in finance or industry who in 1946 contributed most to advancing American economic ideals at home and abroad."

## U. S. Airports Increase 22%

Despite a drop in the production rate of civil aircraft, from last year, the number of airports in the U. S. increased 22 per cent in the fiscal year ended July 1, and registered aircraft climbed from 57,488 to 93,920, the CAA recently revealed. Highlights of a monthly report to T. P. Wright, Administrator of Civil Aeronautics are given below:

| | 1947 | 1946 |
|---|---|---|
| Airports in Operations, July 1. | 5,251 | 4,306 |
| Commercial | 2,512 | 1,760 |
| Municipal | 1,672 | 1,339 |
| CAA Intermediate | 185 | 209 |
| Military | 599 | 831 |
| All Others | 283 | 167 |
| Total Registered Aircraft, July 1 | 93,920 | 57,488 |
| Scheduled Air Carrier Aircraft, July 1 | 902 | 706 |

(Advertisement)

# Improves Production of Generator Housings with "Lincolnweld"

BY R. C. STUPP,
VICE PRESIDENT IN CHARGE OF PRODUCTION
JACK & HEINTZ PRECISION INDUSTRIES, INC.
CLEVELAND, OHIO

PRODUCTION of housings for aircraft generators has been speeded up and improved by use of "Lincolnweld" automatic welding equipment at Jack & Heintz. Previously the parts were manually welded. The new process not only greatly reduces fabricating time, but halves machining time, eliminates costly annealing and sand blasting and improves quality.

Fig. 1 shows component parts of the generator housing—forged end brackets of SAE 8630 steel, Armco center rings and end brackets of SAE 8630 tubing.

First step is to make the longitudinal weld in 8 center rings at a time. The rings are press-formed to a circular shape with an O.D. of 6⅝". The joint is prepared by machining a 13° angle groove to a depth of 1/16" (see Fig. 3).

Fig. 2 shows the set up for the welding operation. The 8 rings are placed end to end in a fixture which holds them tightly in alignment with clamp screws and drawbar. The "Lincolnweld" unit travels along the joint and automatically deposits a continuous flux-covered weld at the rate of 12 inches per minute. Penetration is 100%. Bare wire electrode of 1/8" diameter is used. ¾ pound of wire and ¾ pound of flux is consumed per foot of weld. The 8 rings are then removed from the jig and broken apart.

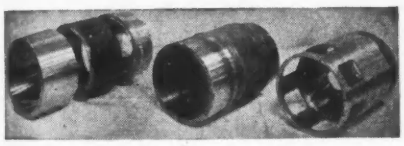


Fig. 1. Component parts of airplane generator housing.

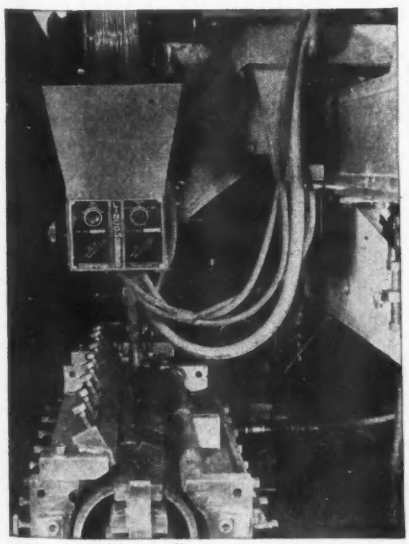


Fig. 2. Eight rings are placed end to end for longitudinal welding.

The next step is welding of the two end brackets to the center ring by circumferential welds. Edges of the brackets and center ring are machined so that when fitted together they form U-groove joints for welding as sketched in Fig. 5. The three parts are assembled in a fixture with a motor-driven spindle and compressed air-operated drawbar.

In this operation, the automatic welding head remains stationary and the work rotates under it, making the welds at the rate of 8⅓" per minute. Penetration is ⅞ of the thickness of the parent metal. About .3 pounds of electrode and .3 pounds of flux are used per foot of weld, the two complete circumferential welds requiring about a pound of each material. A flux dam is held over the joint in light contact with the work by means of a spring. This dam retains the flux shielding the molten weld metal and permits it to solidify as the work revolves during the welding process. The flux dam set-up makes it possible to produce dense, uniform welds with one pass despite the relatively small diameter of the work.

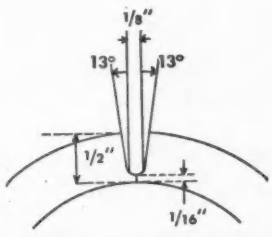



Fig. 3. Preparation of joint for longitudinal weld.

Fig. 4. Removing completed generator housing from welding fixture.

Fig. 4 shows a generator housing being removed from the fixture after completion of circumferential welds.

Welds made by this process have high physical characteristics, passing rigid X-ray, magnafluxing and torque tests.

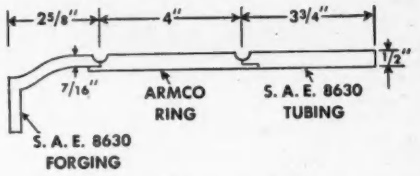



Fig. 5. Cross-section showing how edges of parts are machined to form U-groove joints.

*The above is published by LINCOLN ELECTRIC in the interests of progress. Free Bul. 439 on the Lincolnweld process is available. Write The Lincoln Electric Company, Dept. 434, Cleveland 1, Ohio.*

# Demand for Oil Products Sets New Records

## *Comprehensive Summary of Current Situation Is Presented in This Article by American Petroleum Institute*

THE demand for oil products is setting new records and is substantially higher than the wartime demand. The United States is now using as much oil as did the entire world about 10 years ago. So far in 1947, the domestic consumption of finished products, manufactured and refined, by the American petroleum industry is at the rate of about 574 gallons a year for every man, woman and child in the country. That figure is an increase of 110 gallons, or 23.7 per cent over the 464 gallons per capita in 1941, and 56 gallons, or 10.8 per cent over the 518 gallons average in 1946.

This year's (1947) total demand, including exports, on the United States' petroleum industry for all oil products is estimated at 2,092,400,000 barrels (5,733,000 barrels a day) by the U. S. Bureau of Mines, an increase of 7.0 per cent compared with the year of wartime peak demand of 1,955,668,000 barrels (5,358,000 barrels a day) in 1945, 7.7 per cent more than the 1,942,165,000 barrels (5,321,000 barrels a day) in 1946, and 31.2 per cent higher than the 1,594,609,000 (4,369,000 barrels a day) in 1941. By principal products, the estimated 1947 demand, including exports, shapes up as follows:

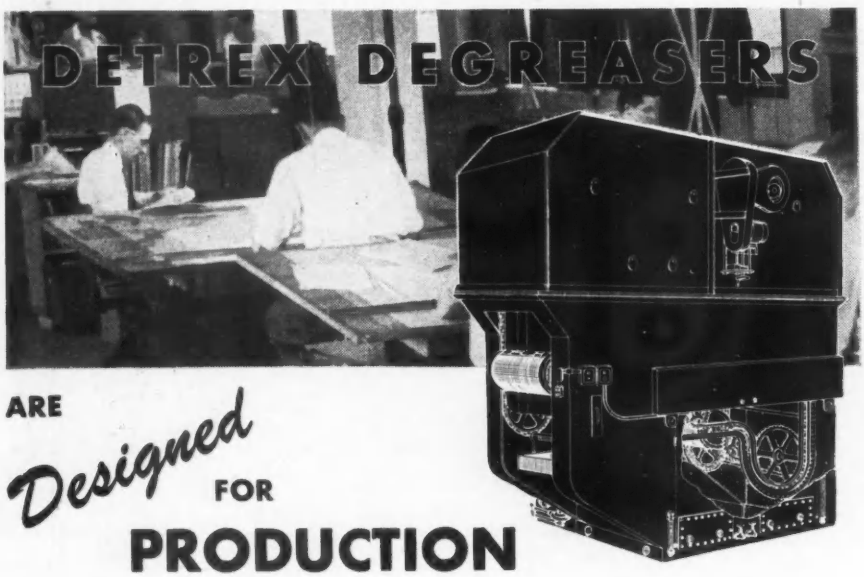
Gasoline demand is estimated at 825,600,000 barrels (2,262,000 barrels a day) an increase of 131,012,000 barrels, or 18.9 per cent compared with the 694,588,000 barrels (1,903,000 barrels a day) in 1941 and an increase of 45,378,000 barrels or 5.8 per cent over the 780,222,000 barrels (2,137,600 barrels a day) in 1946.

Distillate fuel oil demand, the lighter types of fuel oil used for home heating, by utilities for gas enriching purposes and for Diesel engines, is estimated at 310,700,000 barrels (851,200 barrels a day) in 1947 compared with 272,318,000 barrels (746,100 barrels a day) in 1946 and 189,749,000 (519,900 barrels a day) in 1941. Kerosene demand this year is estimated at 110,400,000 barrels (302,500 barrels a day) compared with 97,725,000 (267,700 barrels a day) in 1946 and 72,690,000 (199,200 barrels a day) in 1941.

Residual fuel oil, the heavy grade used by ships and industry, and some for plant heating, is expected to reach a demand of 511,200,000 barrels (1,400,500 barrels a day) in 1947 compared with 486,637,000 (1,333,300 barrels a day) in 1946 and 397,536,000 (1,089,140 barrels a day) in 1941. All other products, including lubricating oils, asphalt, coke, wax and crude oil used as such, etc., make up the demainder of the total estimated demond of 2,092,400,000 barrels for 1947.

The total domestic demand for all oil products in 1947 will be about 1,947,000,000 barrels (5,334,000 barrels a day) a new record. This would compare with 1,790,961,000 barrels (4,907,000 barrels a day) in 1946; 1,772,685,000 barrels (4,857,000 barrels a day) in 1945, the peak wartime year, and with 1,485,779,-

(*Turn to page* 154, *please*)


ARE *Designed* FOR **PRODUCTION**

The line of Detrex standard solvent vapor degreasers contains units capable of fitting into any production line.

The 1 DC-750, for example, is a conveyorized one-dip concentrator which has been designed to meet the degreasing requirements of screw machine shops.

**HERE'S WHY THE 1 DC-750 IS FAVORED FOR THIS JOB**

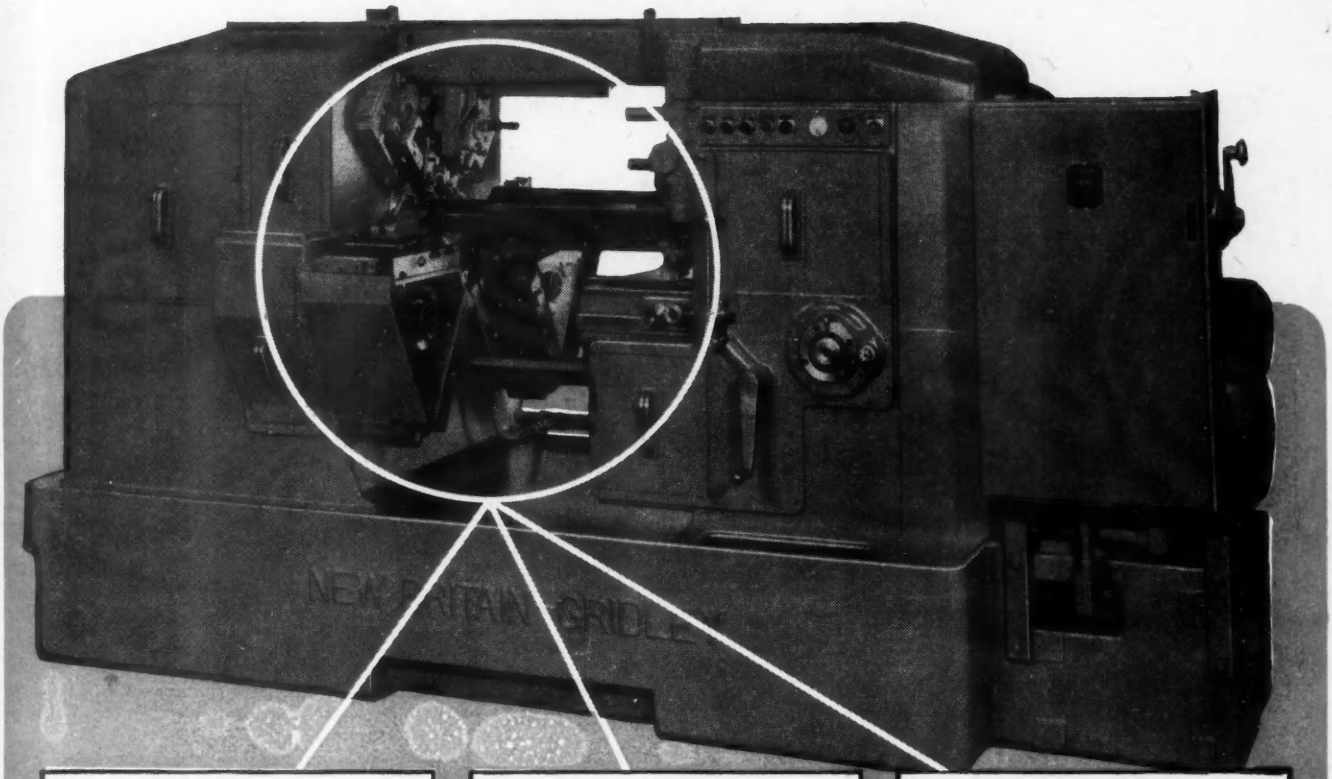
1. Its overall height overcomes low ceiling limitations; it occupies less than 75 square feet of floor space.
2. Rotary and flat baskets can both be used, or rotary alone—depending upon production requirements.
3. Each basket is stopped at predetermined stations by a solenoid brake—facilitating loading and unloading.

Yes, most standard degreasers are stocked for prompt delivery. Call the Detrex field representative nearest you for complete information.

DETREX Corporation
DETROIT 32, MICHIGAN
E-172

# NEW BRITAIN'S NEW LINE OF SCREW MACHINES

## Answers the Need for Lower Costs and Higher Productivity



### QUICK SET UP

1. No cam to change for main tool slide. Strong, positive universal cam selects feed stroke without changing high point, stops or total stroke.
2. No cam to change when adjusting stock feed-out length.
3. Cross slide cams directly behind slides minimizing linkage. Remove three screws with cover and cams pull off.
4. Micrometer adjustment in both directions on all cross slides, all independent of stops.

### SYMMETRICAL RADIAL TOOLING

1. Five heavy-duty forming slides and cut off slide evenly spaced about carrier making line of forming thrust identical in each position.
2. Tool holders interchangeable among forming slides, also on main tool slide.
3. Greatly increased chip clearance and capacity so essential with carbides.
4. Flexibility for auxiliary threading attachments. Accelerating drives in every position.

### FOOLPROOF, AUTOMATIC OPERATION

1. Shoulder height, complete control panels at front and rear of machine.
2. Automatic stop shuts off machine and flashes red light when spindle is empty.
3. Program wheel on outside of powercase shows complete cycle of machine.
4. Machine stops if lubricating oil pressure is low.
5. Gage indicates when machine is operating at other than normal load.

*Fast, powerful machines which will outperform anything modern tools will handle and anticipate future tool developments.* These new machines with their initial and permanent accuracy also incorporate all the previous exclusive features by which NEW BRITAINS are recognized. To these qualities have been added new features, making it possible to accomplish quick setups where short runs are the rule. Built massive to handle the horsepower required for steady feeds for carbides on tough forming steel jobs, they are also designed for super high-spindle speeds, essential for brass and aluminum. Six spindles up to 2¼" capacity.

THE NEW BRITAIN MACHINE CO.

NB

NEW BRITAIN

*Automatics*

THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN-GRIDLEY MACHINE DIVISION
NEW BRITAIN, CONNECTICUT

M-01062

## but he Wasted Time Today...

*Joe* has just finished a fair day's work, and he's mighty tired—but it's a fact that he wasted time today. He stayed right on the job—no loafing for him—yet the time he spent lifting and lugging heavy materials and getting heavy work into his machine and out again was not productive time. There are many *Joes* in industry today, but their numbers are decreasing constantly, mainly because plant engineers are learning that continuous flow handling methods eliminate this inefficiency, and are applying these methods. A smooth, controlled flow of materials to machines goes a long way toward increasing production and keeping worker fatigue at a minimum. Mathews Engineers are specialists in continuous flow handling methods, and make available to American and Canadian industry the facilities of three modern strategically located plants, and the benefit of many years of experience in dealing with conveying problems in both light and heavy industry.

MCC

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ELLWOOD CITY, PENNSYLVANIA

**MATHEWS CONVEYER COMPANY WEST COAST**
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**MATHEWS CONVEYER COMPANY, LTD.**
PORT HOPE, ONTARIO

*Engineering Offices or Sales Agencies in Principal American and Canadian Cities*


# Demand for Oil Products

(*Continued from page* 152)

000 barrels (4,071,000 barrels a day) in 1941.

Export demand for American oil products is estimated at 145,000,000 barrels (397,300 barrels a day) for all of 1947 compared with 151,204,000 barrels (414,250 barrels a day) in 1946 and 108,830,000 barrels (298,200 barrels a day) in 1941.

Contributing to the record demands for products in the United States are several important factors, namely:

**1. Retoration of motor vehicle usage:**

As of June 30, 1947, registrations of such vehicles may approximate 36,000,000 according to estimates, an increase of at least 1,626,998 compared with the 34,373,002 registered on Dec. 31, 1946, and compared with 34,842,847 on Dec. 31, 1941, the prewar peak.

Broken down into various categories by the U. S. Public Roads Administration, as of Dec. 31, 1946, the motor vehicle registrations included 28,100,188 privately owned automobiles, 119,937 buses and 5,725,692 trucks. Federally-owned vehicles comprised 21,779 automobiles, 482 buses and 41,164 trucks, while vehicles owned by states, counties and municipalities comprised 91,369 autos, 53,166 buses, 219,225 vehicles of various kinds, including trucks. An accurate segregation of vehicles for June 30 of this year is not available.

**2. Large Military requirements:**

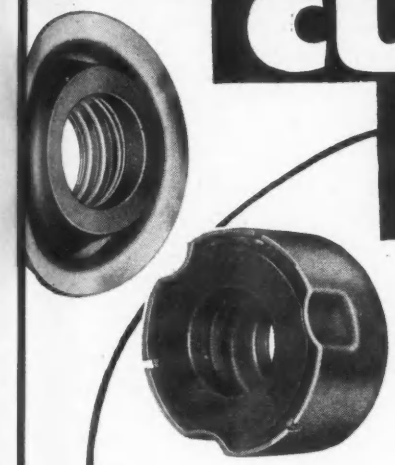
For military and shipping needs in the fiscal year to end June 30, 1948, the Army-Navy Petroleum Board estimates its needs at 81,800,000 barrels (224,100 barrels a day) with some indications that these needs may be lifted considerably. The peak for military requirements during the war was reached in the early part of 1945 when it was at the rate of 1,600,000 barrels a day, for a short period, equal then to about 32 per cent of the domestic industry's production at that time. In 1938, prior to the war in Europe, needs for the military services—Army, Navy, and Coast Guard—approximated less than 12,000,000 barrels annually, fluctuating slightly one way to the other, and equal to only about 14 per cent of those for the current year.

**3. High level of industrial production:**

This high rate of production, according to the Federal Reserve Board, stood at an index of 186 at the end of May, last. It compares with a monthly average of 162 for all of 1941 and predicates a relatively corresponding increase in demand for heavy fuel oil and industrial lubricating oils, and gives impetus to the demands for other products. The demand for lubricating oils for industry over a period of years, for instance, has

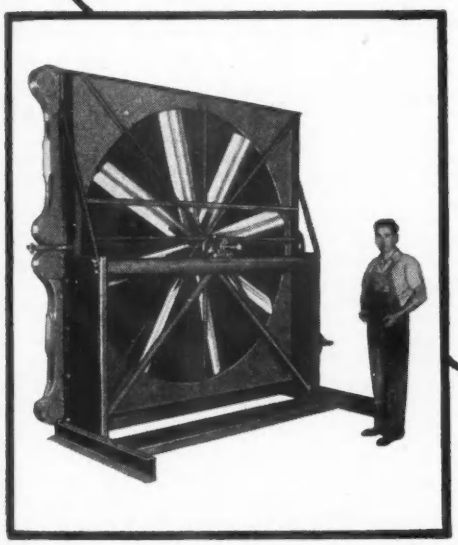
(*Turn to page* 156, *please*)

# SCHWITZER-CUMMINS COMPANY... *Specialists*

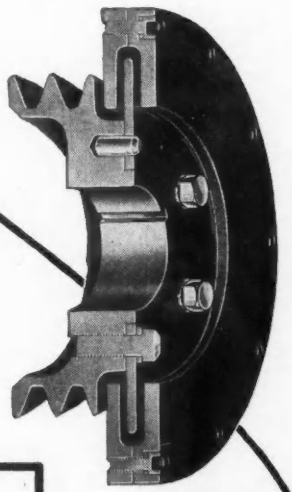


UNIT TYPE AUTOMATIC SHAFT SEALS

● For 30 years we have been supplying the country's fine engine builders with OIL PUMPS, WATER PUMPS, SUPERCHARGERS, COOLING FANS, AUTOMATIC SHAFT SEALS and TORSIONAL VIBRATION DAMPERS OF FRICTION AND FLEXIBLE RUBBER MOUNTED TYPES. The volume has been enormous and much of it has been the creation of our own engineering skill and laboratories. Such long and diversified service to the industry has built for us an unusual background from which to recommend what is best in design and application and then produce it. We solicit your inquiries in the belief that we can be of assistance in your engineering problems and save you money as well. WHATEVER THE APPLICATION, WE HAVE SOMETHING TO FIT YOUR NEEDS.

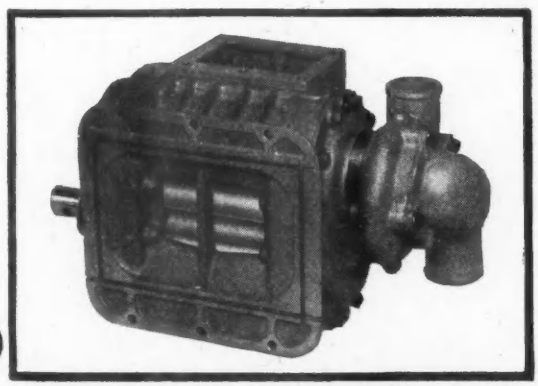


HY-DUTY cooling fans—6 inches to 8 feet—there is one for ALL sizes internal combustion engines. (Illustration) 81 inch diameter Hy-Duty fan on jacket water cooler.



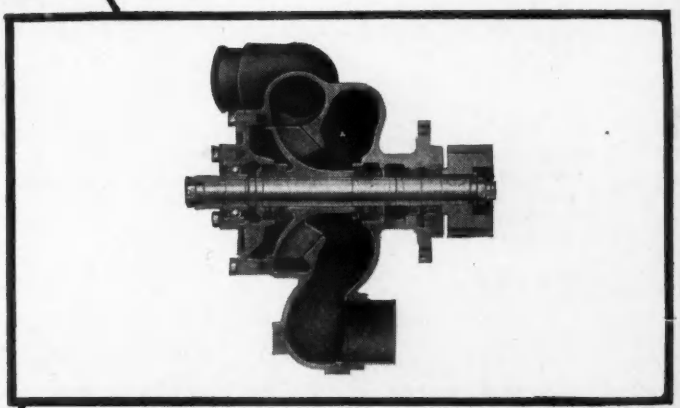
● ***We offer a complete water pump service, embracing an entire pump, a fine impeller, or a superior automatic shaft seal.***

Torsional vibration dampers of friction and flexible rubber mounted types for gasoline or Diesel engines up to 500 HP.



Schwitzer-Cummins Superchargers, centrifugal and positive displacement, are built to our design or customer's requirements in a range of sizes to supercharge engines 50 HP to 500 HP rating, pressure ratios of 2 to 1 maximum, with drives to suit the application.

(Illustration). Supercharger-water pump combination for six cylinder, two cycle Diesel engine.



Oil Pumps—circulating and scavenging—Water Pumps—Low or high pressure requirements—for all types cooling fluids.

(Cutaway view) Water Pump for 280 HP Diesel engine showing bearing and automatic shaft seal construction.

*Send today for our new book,*
**"Automatic Shaft Seals—a Schwitzer-Cummins Development"**

**SCHWITZER-CUMMINS COMPANY** 1125 MASSACHUSETTS AVENUE
INDIANAPOLIS 7, IND., U.S.A.

# Demand for Oil Products Is Setting New Records

(*Continued from page* 154)

shown a similarity to the industrial production index. Needs for the current year are estimated at about 16,000,000 barrels of lubricating oils for industrial used, based on the index, which would compare with 14,300,000 barrels used in 1946 and with 14,400,000 barrels in 1941. These industrial demands for lubricating oils are exclusive of demands for automobiles, motor boats, tractors, and certain other internal combustion engines.

4. **Farm prosperity:**

A high level of farm income has enabled the purchase by farmers of considerable new equipment using gasoline, Diesel and lubricating oils. In the mid-west, as an instance, farm use of oil products has nearly doubled since just prior to the war. Attesting, in part, to this higher demand is the fact that there are now in use on farms approximately 2,700,000 tractors. It is estimated that these tractors will consume approximately 2,821,000,000 gallons of gasoline, tractor or Diesel fuels this year, an increase of more than a billion gallons, compared with the estimated 1,446,000,000 gallons consumed by approximately 1,783,000 farm tractors in 1941.

5. **Increased use of Diesel engines:**

Industry, railroads, buses and trucks are using more Diesel engines. At the beginning of this year, Diesel horsepower in use, exclusive of military, was estimated at 43,500,000 represented by 113,941 installations, which will use an estimated 62,000,000 barrels of Diesel fuel this year. In contrast, there were 19,920,000 horsepower in use in 1941, represented by approximately 22,100 installations, and fuel consumption approximated 24,800,000 barrels. The increase in demand for Diesel fuel in the period amounts to 150 per cent.

6. **Increased Burner Installations:**

The number of domestic and commercial installations for heating with oil is increasing rapidly. Installations of oil burners for central heating in homes and for small stores, using light fuel oil, were estimated at 3,100,000 as of June 30, 1947, which would compare with 2,821,044 at the end of 1946. On Dec. 31, 1941, such installations amounted to 2,402,060.

Commercial heating installations, using heavy fuel oil, totaled 383,560 on Dec. 31, 1946 (an estimate for June 30, 1947, is not available) compared with 287,595 on Dec. 31, 1941.

7. **Increased demand for Liquefied Petroleum Gas:**

Demand for this gas, commonly referred to as "bottled" gas is by consumers in rural and small-town areas, as well as in some suburban areas, and large quantities are used by industry. In 1946 the estimated sales of this gas were 1,425,000,000 gallons, exclusive of amounts used for synthetic rubber, an increase of 29.5 percent over the 1,100,000,000 in 1945, and 208 percent over the 462,852,000 gallons in 1941. This product of the industry has experienced a rapid and substantial rise in sales each year since 1926.

8. **Aviation Gasoline Demand:**

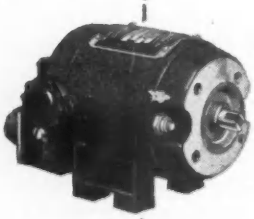
Contrary to most other oil industry products, aviation gasoline demand has shown a decline since the war's end. From a demand in 1941 of approximately 50,000 barrels a day, the demand soared to 600,000 barrels a day in the second quarter of 1945. In the current year the demand has been approximately 44,000 barrels a day for the first four months, but it is expected that this figure will rise substantially henceforth.

(*Turn to page* 158, *please*)


Superior PERFORMANCE

an advantage of special application

Lamb Electric MOTORS

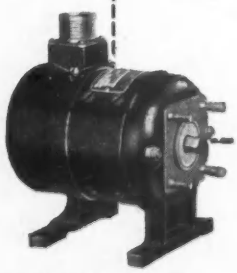


Compactly designed motor developed for metering pump and special instrument service.

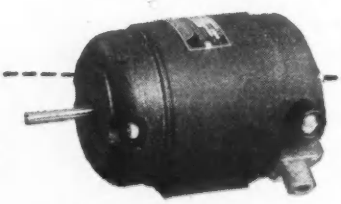
Specially designed for each particular application and with thorough dependability built into every part, Lamb Electric motors have established a reputation for long, trouble-free operation.

In addition to *special application*, thorough engineering and exacting manufacture contribute to the superior performance of Lamb Electric motors.

THE LAMB ELECTRIC COMPANY
KENT, OHIO

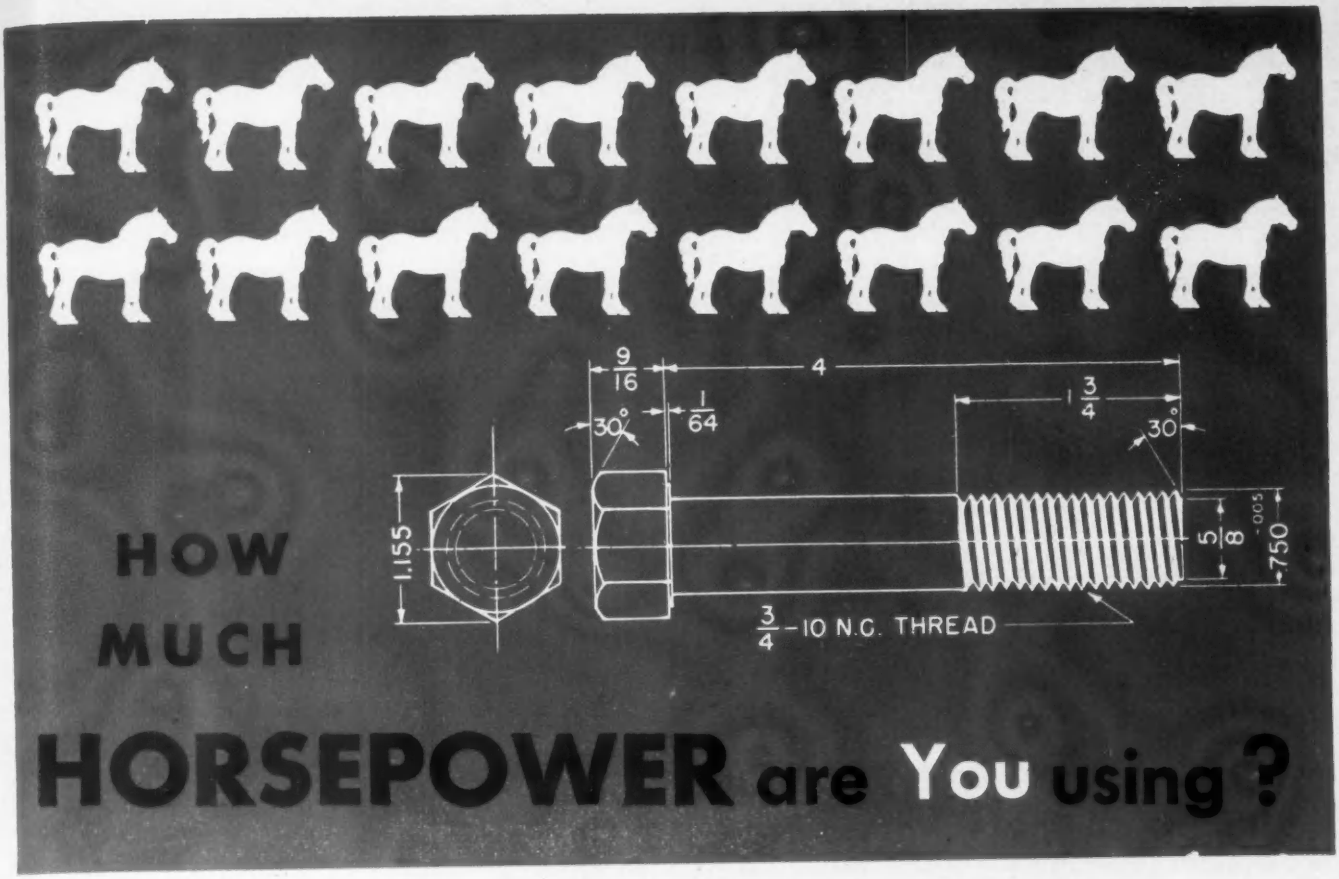


Intermittent high torque motor with low weight factor is adaptable to many general applications.



This small sturdy motor can be readily adapted to a wide range of industrial applications.

Lamb Electric
SPECIAL APPLICATION FRACTIONAL HORSEPOWER MOTORS




Here is a typical example of the effective use of carbide cutting tools on a Jones & Lamson No. 3 Universal Ram Type Turret Lathe. The depth of the main turning cut is less than ¼". *Yet the single carbide turning tool creates a load in excess of 16 horsepower.*

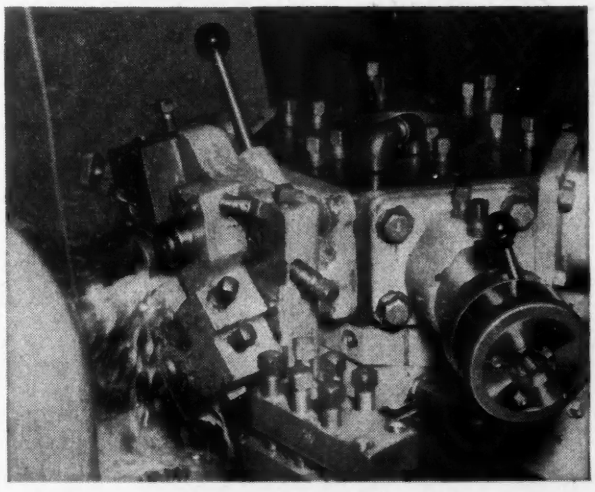
Of course, we know this simple, ordinary job would normally be routed to an automatic. But we put it on a Turret Lathe to give you, *a practical, simple example of the horsepower required for effective turning with Carbide tools.*

Our folder "One a Minute" describes this operation in detail, and contains vital information for anyone contemplating the purchase of a Turret Lathe, the general use of carbide cutting tools, and greater efficiency in metal turning.

Send for this folder. Or better yet, telephone or write for a Jones & Lamson engineer who will be glad to consult with you on all phases of your metal turning problems.

Jones & Lamson Lathes are designed specifically for the most efficient use of carbide cutting tools.

**This ¾ x 4" Cap Screw is machined entirely with carbide cutting tools except for the high speed steel Chasers in the die head. *Total time per piece is one minute.***



**Spindle speed 1500 RPM Feed .033**

**JONES & LAMSON** MACHINE COMPANY, Springfield, Vermont, U. S. A.

Manufacturer of *Turret Lathes* and Fay Automatic Lathes
Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

# Demand for Oil Products Is Setting New Records

(*Continued from page* 156)

**9. Miscellaneous Uses:**

New products are being developed constantly by the industry which, together with new uses for existing products, are adding to the demand factor. For instance, a relatively new market for kerosene is in the tobacco-growing industry where farmers are switching to this fuel in preference to wood for curing tobacco leaves in big quantities.

Chemicals is another rapidly growing branch of the industry, although the volume of business done is only a small portion of the total petroleum business. During the war the industry was a principal supplier of butadiene, used in synthetic rubber, and of toluene, used in making TNT. The oil industry is an important source of other chemical products such as alcohols, glycerine, a large variety of petroleum chemicals used in making medicinal preparations and cosmetics, inseeticides, weed destroyers, etc. The business in petroleum chemicals is growing steadily and it is becoming increasingly important.

This year's sales of outboard motors (fiscal year ended Sept. 30, 1947), are expected to be triple those in the same period of 1941 when 167,000 were sold. In the 1946 fiscal year sales amounted to 202,000 units so that this year's sales will more than double that record. In the six months ended March 31, 1947, sales totaled 249,818 motors, according to the Outboard Motor Manufacturers Association.

**Supply Is Ample**

The supply of oil (technically stated: the supply of liquid petroleum hydrocarbons) is ample to meet the total demands in 1947 which are estimated at 5,733,000 barrels a day. Here is how the supply is made up:

Production of crude oil in the United States currently is running at the daily rate of about 5,100,000 barrels (average for the four weeks ended July 5). To this crude production is to be added approximately 362,000 barrels daily of other liquid hydrocarbons — natural gasoline and benzol—and customary imports of heavy fuel oils and crude oil which more than offset exports. These imports are expected to average 450,000 barrels a day, with crude production averaging 5,000,000 barrels a day for the full year 1947, and other liquid hydrocarbons averaging 362,000 barrels a day; an aggregate supply of about 5,812,000 barrels is available to meet demands estimated at 5,733,000 barrels a day average for the full year.

Thus there is an ample supply of basic petroleum—crude oil and other liquid hydrocarbons—to meet the unprecedented demand for oil products, but facilities for gathering, transporting and distributing them are not adequate for the peak demands. The available facilities are being used at maximum to serve the public, the military and other customers.

**Crude Production At Record**

Current crude oil production averaging 5,100,000 barrels a day is a new high record. It compares with the wartime peak output of 4,944,250 barrels a day in the week ended July 21, 1945. On latest reports, there is additional potential production available at the present time of approximately 165,000 barrels a day in the United States but it cannot be moved to midwest refining centers in adequate quantities by means of already overloaded transportation facilities.

Production of 5,100,000 barrels a day of crude oil compares with an average of 4,749,000 barrels in 1946 (1,733,424,000 barrels for the full year) and with 3,842,000 barrels a day (1,402,228,000 barrels for the full year) in 1941. For

(*Turn to page* 160, *please*)

Typical of many Wyman-Gordon developments is this complicated light alloy forging used in the wing structure of one of Uncle Sam's latest fighting planes.
Modern transportation, on the ground and in the air, requires the maximum use of forgings. For greatest strength with minimum weight and uniformity of quality no other method of forming metal competes with the forging process.
Are you taking full advantage of the constantly growing range of forgings? Wyman-Gordon forgings all the way from five up to one thousand pounds.
Standard of the Industry for More Than Sixty Years
WYMAN-GORDON
Forgings of Aluminum, Magnesium, Steel
WORCESTER, MASSACHUSETTS, U. S. A.
HARVEY, ILLINOIS - DETROIT, MICHIGAN

Johnson Bronze Sleeve Bearings Give You Every Worthwhile Advantage

Johnson Bronze Sleeve Bearings Give You Every Worthwhile Advantage

- LOW COST
- PRECISION
- QUIET
- LONG LIFE
- CORROSION RESISTANT
- UNIT CONSTRUCTION
- LOAD CARRYING CAPACITY
- HIGH RESISTANCE TO SHOCK
- LOW COEFFICIENT OF FRICTION
- EASY TO INSTALL
- CONFORMABILITY
- NATION WIDE SERVICE

# *The* MODERN ASSEMBLY LINE *depends on* PRECISION

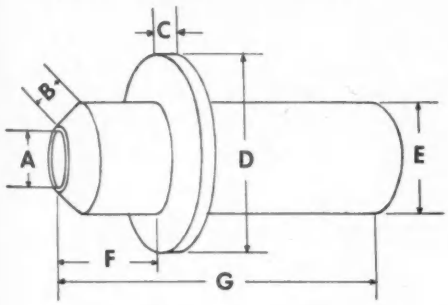
Ever watch the assembly line in a modern industry? They take gears produced in New England . . . shafts turned in Ohio . . . housings cast in Indiana . . . and Sleeve Bearings made in New Castle. With a few facile movements by the operator a motive unit is produced . . . ready to run. This simplified assembly is possible *only* when each manufacturer works to a precise set of measurements . . . clearly defined tolerances.

Producing Sleeve Bearings *exactly* according to specifications is an easy assignment for Johnson Bronze. We have the men . . . the machines . . . and over forty years' exclusive bearing experience. We can help you select the correct *type* of bearing . . . help you decide on the proper dimensions . . . and then produce your requirements right in every detail . . . *and on time.* Why not call us in TODAY?

## JOHNSON BRONZE CO.

625 South Mill Street . New Castle, Pa.

*Precise*
AT EVERY POINT




**A**—*Inside Diameter* . . . concentric with outside diameter.

**B**—*Chamfer* . . . right length . . . correct angle.

**C**—*Flange Thickness* . . . stout enough to take the thrust.

**D**—*Flange Diameter* . . . ample enough to distribute the load.

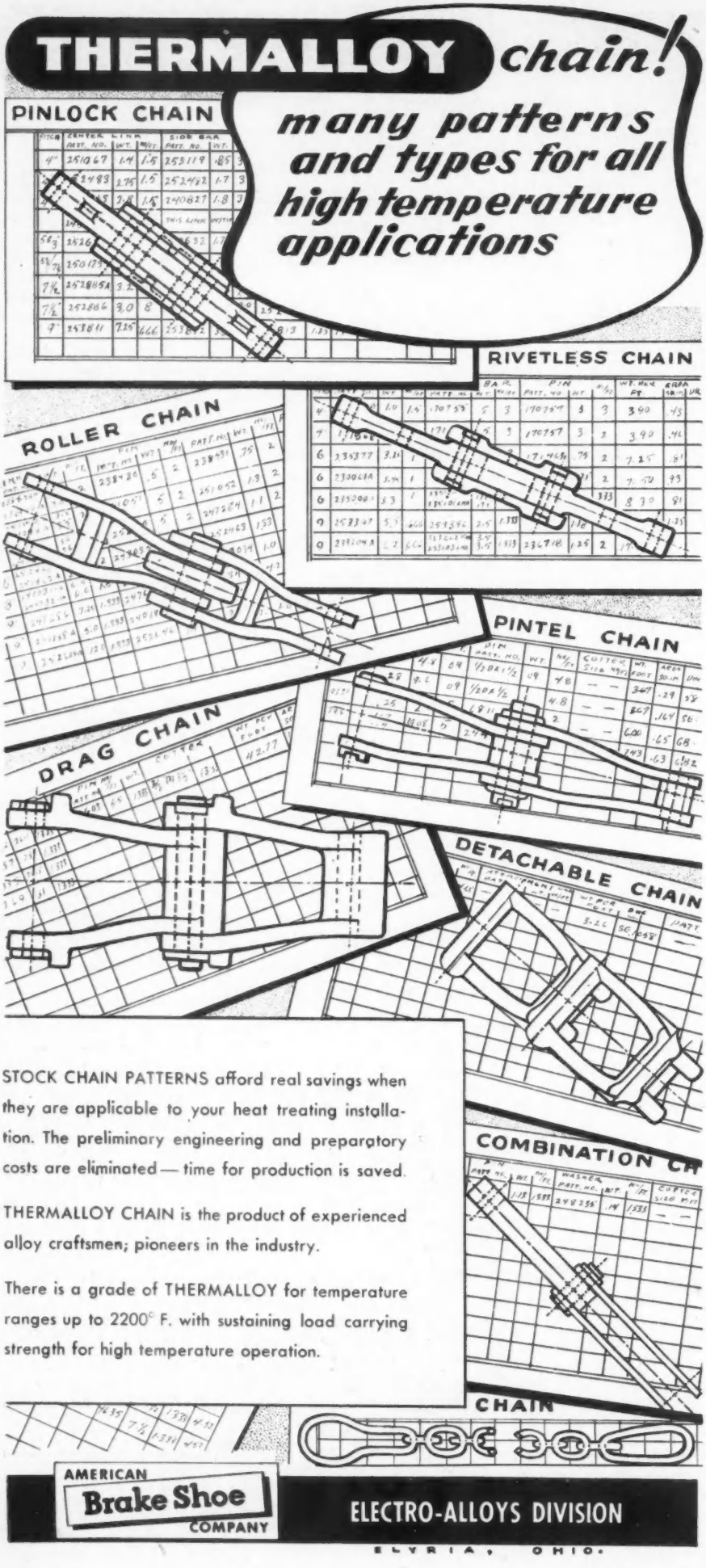
**E**—*Outside Diameter* . . . correct dimension for easy assembly.

**F**—*Flange Position* . . . to "locate" the bearing.

**G**—*Length* . . . held to right limits . . . sufficient to carry the load.

**X**—*Alloy*—Selected to suit operating conditions.

JOHNSON BRONZE
SLEEVE BEARING HEADQUARTERS
BRANCHES IN 18 INDUSTRIAL CENTERS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STOCK CHAIN PATTERNS afford real savings when they are applicable to your heat treating installation. The preliminary engineering and preparatory costs are eliminated — time for production is saved.
THERMALLOY CHAIN is the product of experienced alloy craftsmen; pioneers in the industry.
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AMERICAN Brake Shoe COMPANY
ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO.


# Demand for Oil Products

(*Continued from page* 158)

the wartime peak year—1945—the industry produced an average of 4,695,000 barrels of crude oil daily, or a total of 1,713,655,000 barrels for the full year.

**Proved Reserves Increased**

The oil industry has been able, over the years, to increase its inventories of proved underground reserves. At the beginning of 1947 the country's proved crude oil reserves in the ground were at a new high record of 20,873,560,000 barrels. In addition there were 3,353,887,000 barrels of natural gas liquids (condensate, natural gasoline and liquefied petroleum gas) which would lift the total reserves to 24,227,447,000 barrels. Since figures are not available for December 31, 1945, to show total liquid hydrocarbons other than crude oil, a comparison of the reserve position can be made only in terms of crude oil, and the total of the latter at the beginning of this year shows an increase of 931,714,000 barrels, or 5 per cent as compared with the end of 1945. At the end of 1941 estimated proved reserves of crude oil and condensates totaled 19,589,296,000 barrels including possibly 800,000,000 barrels of condensates. Thus, nothwithstanding an unusually heavy drain on reserves during the war years, the industry was able to show an improevment in this position.

**Refining Capacity Adequate**

According to a recent report, the industry's refining capacity as of June 30, 1947, was estimated at 5,648,102 barrels a day, a clear indication that from an overall viewpoint there is no current shortage of refining facilities in this country. Some of this capacity, however, is shut down because it is badly located from a transportation viewpoint, or partially or wholly obsolete, or unable to handle the high sulfur crudes which are available.

In the four weeks ended July 12, last, the refining division of the industry was operating at 90.8% of capacity and processing an average of 5,127,000 barrels of crude oil daily. This rate of operating marks a new record, and is an increase of 33 percent compared with the average daily runs to refineries in 1941.

Aside from the current refining production, the industry has substantial inventories of refined products—240,907,000 barrels, including natural gasoline at the end of April, 1947, and slightly higher today. These refined products stocks, however, are not distributed uniformly throughout the country and because of transportation shortages mentioned previously, temporary exhaustions of inventories of gasoline and burning oils are anticipated in local areas, especially in the midwest.

(*Turn to page* 163, *please*)

# Demand for Oil Products

(*Continued from page* 160)

New transportation facilities, as well as other construction, are under way but with materials shortages and slow deliveries very little new capacity will become available before the end of 1947, so that the problem currently is one of maximum utilization of existing equipment.

There is an urgent need for additional movements of crude oil and products into the middle west. The high rate of refinery operations there has reduced crude oil inventories sharply in the past year. At present the industry there is processing about 1,300,000 barrels of crude oil a day, but crude production in the area has actually declined since 1941, and a gap of about 340,000 barrels a day between nearby production and refining operations has developed. To fill this gap requires the transportation of large additional amounts of crude oil into the middle west from other areas.

Present pipe lines to that section are operating at capacity. Additional supplies are being moved by barges and tank cars.

**New Pipe Line Capacity**

Pipe line capacity is being expanded to the middle west from west Texas and about 60,000 barrels a day of capacity is expected to be in operation by the end of this year, with perhaps another 250,000 barrels a day in operation sometime next year. All refineries, however, do not have adequate facilities for processing high sulfur-content West Texas crude oil. Such crude requires special alloy steel and it will be sometime before the necessary refinery modifications can be made.

Several mid-west refiners which are now equipped to process this crude oil are obtaining large quantities from West Texas by tank car. This form of transportation requires higher costs than would be justified under normal conditions. Some West Texas crude also is moving to Gulf refineries for processing. The West Texas area, incidentally, is one where additional supplies of crude oil are available. For the southwest area it is estimated that about 128,000 barrels a day of additional crude oil could be supplied if additional transportation were available.

**Sectional Differences in Supply-Demand Situation**

MIDDLE WEST: Several middle west companies recently were forced to allocate gasoline supplies to jobbers and distributors in twelve states during part of June and all of July and August. Because transportation problems are intensified there, the middle west is the most critical area in the country. The high demand in this region is attributed to:

(1) The number of cars in use which are now at, or near, prewar levels and the fact that the owners are using them more; and that the old age cars in use are less efficient and consume more fuel;

(2) Consumption of gasoline on farms is approximately double that of prewar largely because of the increased number of tractors in use, and

(3) Home heaitng and Diesel locomotives have increased tremendously the demand for fuel oils.

Indicative of the supply situation in the mid-west, for instance, is the decline in production of crude oil in Illinois and Michigan. In the four weeks ended July 5 the average daily crude production in Illinois was 186,850 barrels compared with 208,600 barrels in the similar period of 1946, and 362,700 barrels a day average in 1941. For Michigan the decrease in production is less marked but significant under present conditions of demand. Michigan's daily average production of crude oil in the four weeks ended July 5 of this year was 43,650 barrels, while in the same period of 1946 it was 47,100 barrels and for all of 1941 it averaged

(*Turn to page* 164, *please*)

BUT . . .

In retrospect, it appears hazardous and plodding. Today, business and industry demand speed, efficiency, and positive results. In the field of light metals

**Alodizing With**

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is the modern answer to the old problem of protecting aluminum and conditioning it for paint.

ALODIZING is completed in from 30 seconds to 2 minutes. It requires no expensive electrolytic equipment—no special skills. Coating and sealing are achieved simultaneously—in a chemical bath. Except for the "ALODIZING" tank, which must be of stainless steel, only mild steel equipment is needed. Aluminum fabricators who want maximum protection of painted or unpainted surfaces—speed—simplicity—economy—reduced handling—specify "ALODINE".

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AMERICAN CHEMICAL PAINT CO.
AMBLER ACP PENNA.

# Oil Products

(*Continued from page* 163)

44,800 barrels of crude oil output.

Because of the decreases of crude production in these two states, refineries in the mid-west have been forced to seek crude supplies from other areas. Several pipe line projects to bring in more crude would have been completed before now if supplies of steel had been adequate. Coal and steel strikes, and the general shortage of steel has delayed construction by anywhere from several months to more than a year.

EAST COAST: The east coast supply situation depends largely on transportation. The expected increase in demand will make necessary an increase in volume of crude oil and products (principally heavy fuel oil) from foreign sources and the Gulf Coast.

Imports of crude oil and refined products to the United States, most of which come into the east coast, have been at peak levels this year, those for the first six months being estimated at 83,250,000 barrels against 65,348,000 barrels in the corresponding period of 1946. For the full year 1946 imports totaled 135,033,000 barrels and in 1941 there were 97,142,000 barrels imported.

The industry's storage capacity for fuel oil on the east coast is a limiting factor on the amount of fuel oil that can be transported into the area during the summer. The peak of demands for fuel oil this coming fall and winter, which demand it is believed will be at a new high, will place an additional burden on transportation. The best estimate for the east coast is that overall requirements for the immediate future will be met, provided of course, that an abnormally cold winter is not experienced and that there is no shortage of substitute fuel.

At present refinery operations of the east coast industry are exceeding rated capacity, with some uneconomical units also operating. One of the largest refineries is operating at 193 percent of its original rated capacity, with several other units in the area at about 140 percent of such capacity.

WEST COAST: The west coast statistical position appears to be satisfactory both from the standpoint of supply and local demand, although best estimates are that while the industry will meet all potential demands, it will require everything it can produce.

GULF COAST: There is no problem of supplying the demand in this area, it being the largest crude oil producing section and, in addition, having the largest refining capacity. It is an important source of supply of crude oil and products to the east coast.

### Problems Confronting Oil Industry

As previously stated, the principal problem confronting the oil industry today is a lack of adequate transportation facilities, especially of pipe lines, tank cars and barges. Barge equipment is sufficient to meet current requirements except for movements on the Mississippi and Ohio Rivers. Construction of these facilities, as well as others for refining, production and marketing divisions of the industry, are being delayed by shortages of essential materials such as casing and tubing of all kinds, line pipe, compressors, pumps, plates, structurals, castings, sheets, tin mill products, electrical equipment, high and low pressure tank cars, valves and fittings.

Shortages of these materials have made it impossible for the industry to proceed with scheduled expansion and modernization programs. It is estimated that lack of these materials has delayed construction programs anywhere from several months to two or three years.

The situation is especially critical in respect to tank cars needed for the transportation of liquefied petroleum gas (bottled gas) for which an estimated 2371 cars are needed, but the steel available for such cars is wholly insufficient for needed facilities during 1947. The Office of Defense Transportation has estimated that 5270 of these cars will be needed to meet fall and winter requirements of bottled gas.

(*Turn to page* 166, *please*)


MOTORSTAT

The only *POSITIVE* way to determine engine cylinder pressure losses

The MOTORSTAT Engine Condition Testing Gauge is a practical, portable instrument that fills a wide gap between makeshift hand testing and the complex performance testing of an engine by means of a dynamometer.

It takes advantage of the basic function of an engine cylinder and shows up deficiencies inside by introducing a controlled quantity of compressed air via its spark plug hole. It actually measures the leakage of the air past any cylinder part or seal.

Extension adapters can be supplied for use in reaching inaccessible 18 mm. and 14 mm. spark plug holes.

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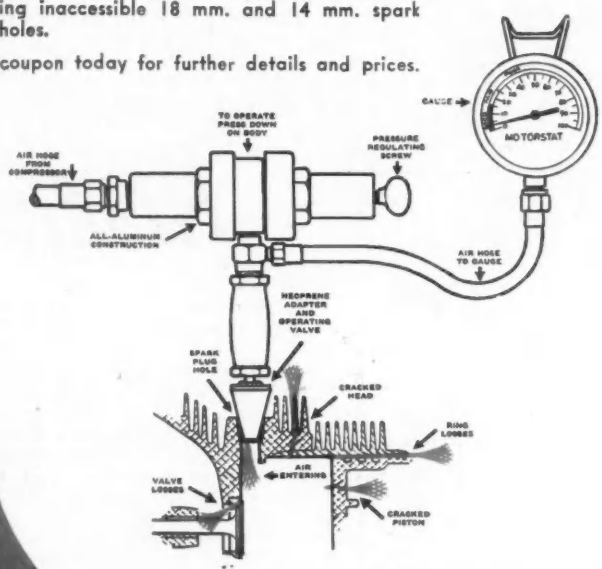


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305 W. Lancaster Ave., Wayne, Pa.

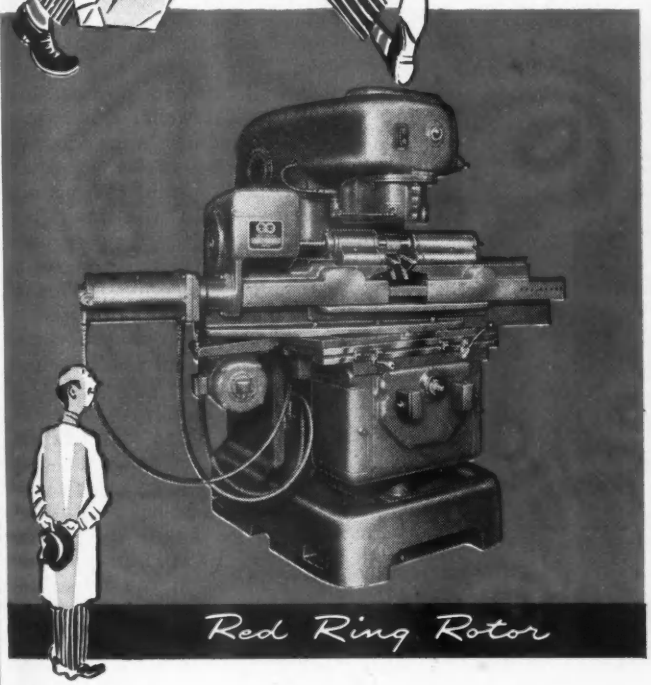
Please send descriptive matter and price list of the MOTORSTAT Engine Condition Testing Gauge.

NAME (please print) .....

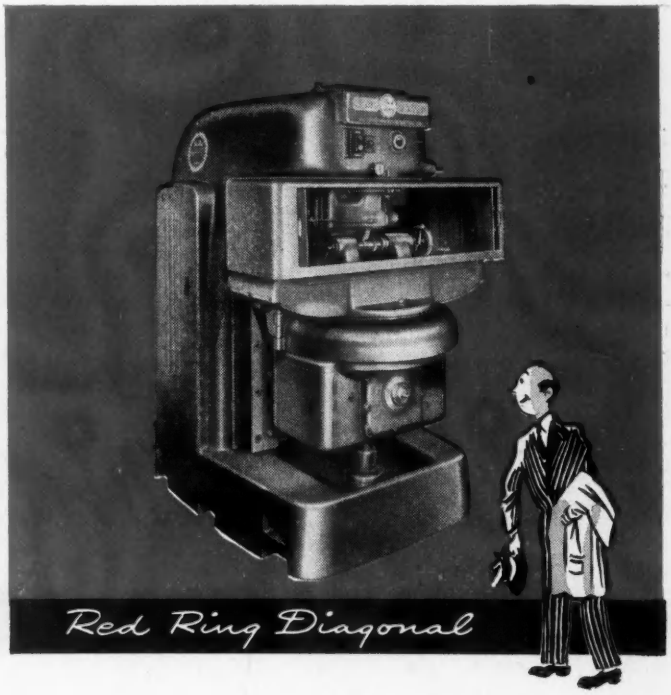
ADDRESS .....

# Going to the Machine Tool Show

If you are interested in modern precision gearing, its production and inspection, you will doubtless be interested in the new Red Ring equipment to be exhibited at the Machine Tool Show in Chicago, Sept. 17 to 26.



Red Ring Rotor



Red Ring Diagonal

Featured in this exhibit will be the new Diagonal Gear Shaving Machine, a high production unit which has materially extended the field of gear shaving.

Another feature will be the new Red Ring Rotor Shaving Machine which has been so successful in reducing the cost of finishing the rotor laminations of electric motors.

Included also will be the standard gear shaving machines, a gear lapping machine, gear checking and sound testing machines.

The latest in broaching practice with naloy broaches, broached parts and cutting tools will be there for your inspection.

National Broach engineers will be at BOOTH 607 to explain this equipment and answer your questions. You are cordially invited to stop by.

2709

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IF THE PERFORMANCE of the equipment you build hinges upon accuracy of service adjustments, consider protecting yourself by utilizing Laminum shims in original assembly.
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THE SOLID SHIM THAT peels FOR ADJUSTMENT

# Oil Products

(*Continued from page* 164)

Against this figure there are only 2908 in service, including 438 which are Government owned.

Allocations for the construction of at least 7500 low pressure cars for petroleum transportation also are necessary to bring the fleet of such cars up to their prewar level. This class showed a decrease of 6000 cars between January 1, 1945 and January 1, 1947, and none of this type has been built since 1942, or is any under construction at the present time because steel is not being made available for the purpose.

**What The Industry Is Doing**

A. To meet rising demands for its products the oil industry is making record capital investments of more than four billion dollars in the two year period—1947—1948—to provide for new and expanded facilities throughout the country, i.e.,

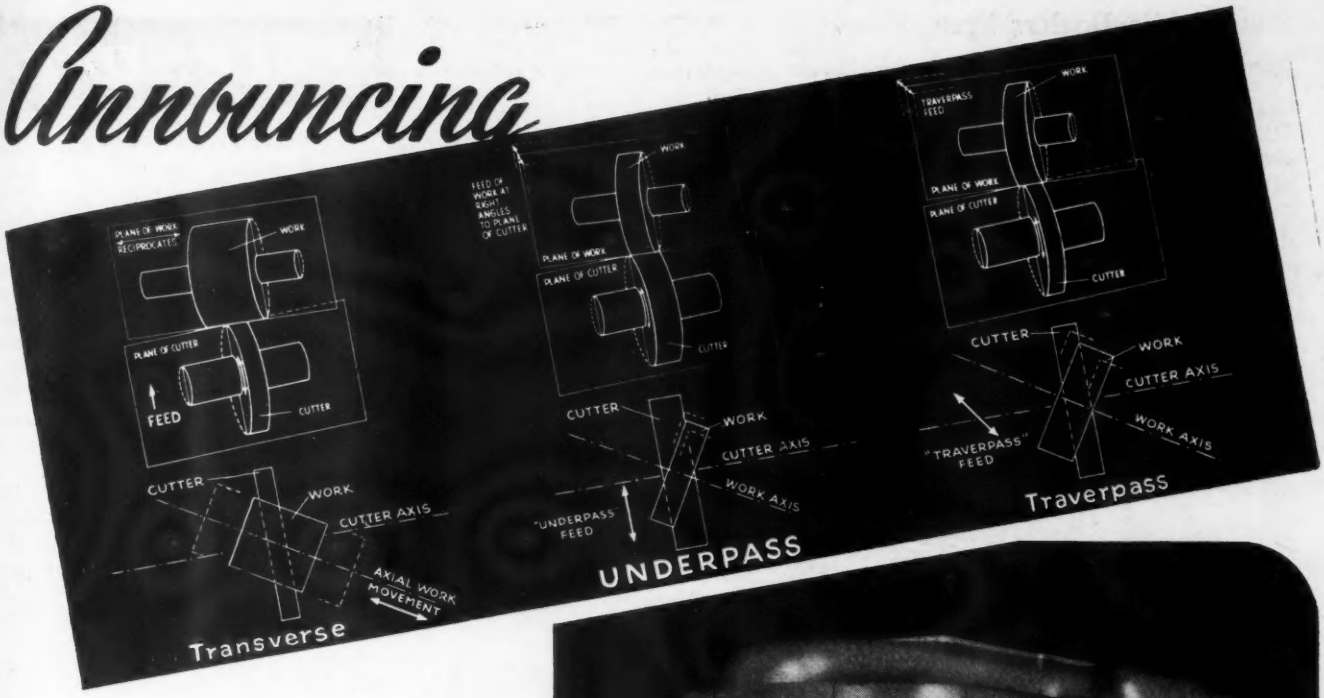
1. It will drill this year an estimated 35,000 new oil wells, a new high record, including approximately 5,000 wells for exploratory purposes in the hope of finding new oil reserves. In the production division alone, the industry will make capital outlays estimated at more than two billion dollars in the two-year period;
2. It has plans under way for construction of refinery facilities having a capacity of about 450,000 barrels of crude daily, but the construction of these installations will take from six to twenty-four months from the start of construction. There is a prospect that this figure will be augmented in the near future. Expenditures for refining facilities in the two years are estimated to exceed one billion one hundred million dollars.
3. It is building new pipe lines, and expanding old ones, as well as providing for other transportation equipment on which it will make an aggregate investment in 1947-1948 of approximately four hundred forty million dollars; and
4. It is investing about four hundred eighty million dollars in new marketing facilities.

B. The industry has built the nation's proved crude oil reserve to a new record and is maintaining production of crude oil at high rates, consistent with sound conservation practices, to assure the nation an adequate supply of products even though some of the production operations are costly.

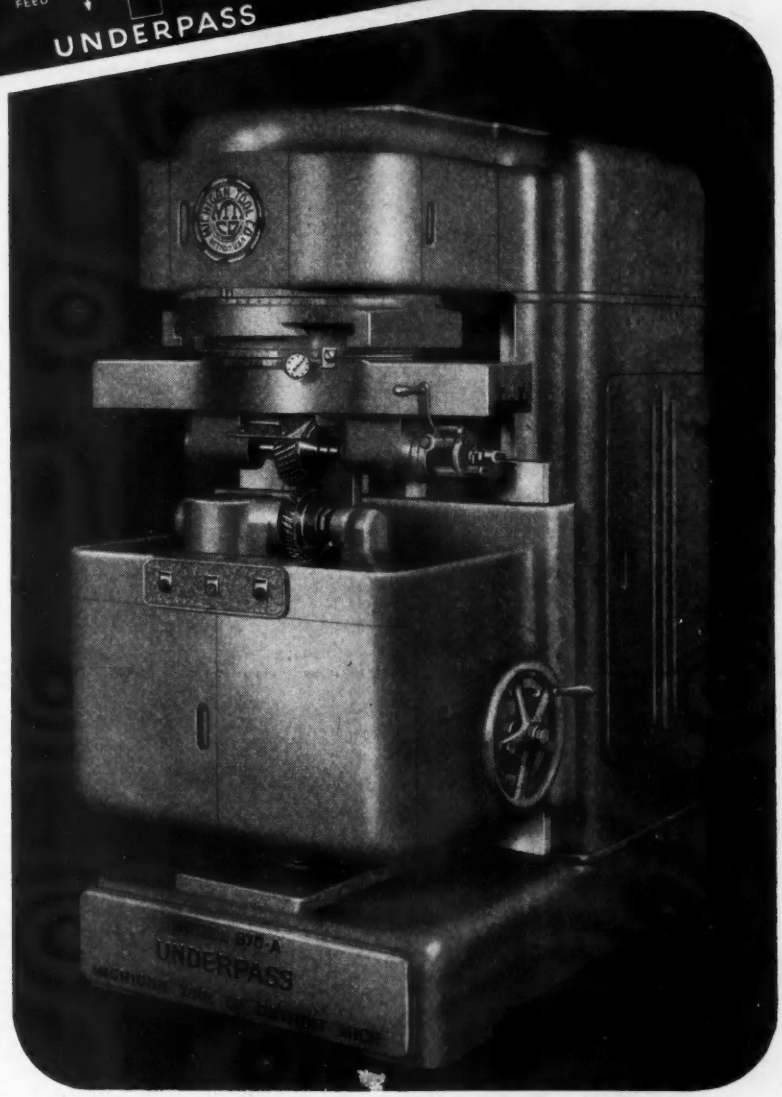
C. It is operating some obsolescent refining capacity in addition to its modern, more efficient facilities, to serve public, military and industrial demands, and some of these refineries are operating well above their rated capacities.

D. It is transporting crude oil and products from the southwest to the middle west by tank cars at greater expense than by pipe line and barge.

# Announcing




## the New 3-Way MICHIGAN 870-A UNDERPASS Gear Finisher




The new Michigan 870-A Gear Finisher not only brings UNDERPASS GEAR FINISHING to a new peak of accuracy, efficiency and speed (12 to 55 seconds, depending on the gear), but also makes available *in the same machine* two other pre-selective methods of gear finishing:

"Transverse" shaving for extremely wide face gears and splines and

"Traverpass" shaving for finishing fairly wide gears with narrow cutters (faster than "Transverse", although not as fast as "Underpass").

Also available (Model 870) without the vertical feed used with the transverse shaving process.

**FASTER LOADING AND UNLOADING:** Quick acting camlock tailstock; work always located *above* cutter; self-clearing "over-center" machine guard.

**FASTER SET-UP:** Merely rotate head-slide to select type of finishing method desired; all electric cycle controls in "sealed" dust-protecting compartment.

**SMOOTHER OPERATION:** Head slide operated through Cone-Drive gearing (more teeth in contact—more contact per tooth).

ORIGINATORS of GEAR-SHAVING

*See it at the Machine Tool Show: Booth 426, or write for Bulletin No. 870A47*

# MICHIGAN TOOL COMPANY

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## Automobile Dealers Plan Modernization Program

B. L. Pulson, director of dealer building design and layout for General Motors Corp., reports that automobile dealers plan to spend $750 million for new construction and modernization of existing properties. He pointed out that many dealers still are not equipped for modern automobile retailing, and that much more interior space is needed for productive work and outside facilities for parking and service. GM is compiling a guide to assist dealers and architects in solving problems of space utilization, operating facilities, and layouts.

## K-F Production Continues Upward

Production at Kaiser-Frazer Corp. is showing a steady upward trend. On July 15 the company turned out 733 cars for a new daily record. Schedules for July called for 15,000 cars compared with 58 the same month a year ago. During June K-F built in excess of 12,000 cars.

85% REDUCTION IN GAGE COSTS

REVERSIBLE GAGES ARE ECONOMICAL

10,000 REVERSIBLES A MONTH

200 GAGES FOR THE PRICE OF 3

At Booth 401 you will not only see a comprehensive line of advanced gages—you will learn how to cut your gage costs to an absolute minimum, while reducing rejects and speeding inspection, with SCC REVERSIBLE Gage.

You save substantially in two ways with long-lasting Size Control REVERSIBLE Gages—reduced plug replacement costs . . . reduced possibility of passing sub-standard parts. The tips of the extra long reversible plugs can be cut off when worn for up to 6 times service. Available in plain or plated steel or Stellite, NORBIDE, Tungsten Carbide and Sapphire.

Size Control has saved industry the cost of millions of gages through originating reversible plug gages, which the American Gage Design Committee has tentatively recommended as an alternate to the regular standard design.

Catalog 47 contains complete information.

TRUE PRECISION FINISHES WITH FAST CENTERLESS LAPPING

Size Control's Centerless Lapping Machines give a precision finish of less than 2 micro inches to cylindrical parts of materials such as steel, carbide, NORBIDE, glass, sapphire. Requires no special operating skill—piece is simply placed between lapping rolls. No costly set-ups or special tools. Handles diameters from .010" to 10.00" with speedy adjustment of roller spacing. Fully described in Catalog 47. Used by: Greenfield, Pratt & Whitney, Sundstrand Machine Tool Co., International Business Machines Co., Firth-Sterling Steel Co. and many others.

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WACKER SALES, *Affiliate* — Precision Inspection Equipment

*Engineering Representatives in Principal Cities*


# CALENDAR

### Conventions and Meetings

Instrument Society of America Conference, Chicago .....Sept. 8-12
Society of Automotive Engineers—Tractor Mtg., Milwaukee....Sept. 17-18
Natl. Machine Tool Builders Assoc. Machine Tool Show, Chicago, Sept. 17-26
Automotive & Aviation Parts Mfgrs. Assoc., Cleveland—Annual Mtg.—Sept. 29
Soc. Automotive Engineers, Aeronautic Mtg., Los Angeles .....Oct. 2-4
French Automobile Salon, Paris...Oct. 2-12
Amer. Soc. of Mechanical Engineers, Petroleum Mech. Eng. Conf., Houston, Tex. .....Oct. 6-8
Societé des Ingenieurs de l'Automobile Paris—20th Anniversary Mtg., Oct. 10-12
Natl. Conference of Industrial Hydraulics, Chicago .....Oct. 16-17
Soc. of Automotive Engineers, Production, Cleveland .....Oct. 20-21
Amer. Soc. Tool Engineers—Semi-Annual Mtg., Boston.....Oct. 30-Nov. 1
Natl. Electrical Mfrs. Assoc., International Lighting Exposition & Conference, Chicago .....Nov. 3-7
Amer. Society of Body Engineers, Annual Tech. Convention, Detroit, Nov. 5-7
Society of Automotive Engineers, Fuels & Lubricants Mtg., Tulsa.....Nov. 6-7
Society of Automotive Engineers-Air Transport Mtg., Kansas City..Dec. 1-3
Amer. Soc. of Mechanical Engineers, Annual Mtg., Atlantic City....Dec. 1-5
Automotive Service Industries Show, Chicago .....Dec. 8-13
Soc. of Automotive Engineers Annual Mtg., Detroit .....Jan. 12-16

## Machine Tool Congress

(*Continued from page* 145)

dent, Marshall & Huschart Machinery Co. and President, American Machine Tool Distributors' Association.

### American Society of Mechanical Engineers

Sept. 24 at Continental Hotel—Dinner 6:30 pm, Meeting, 8:00 pm.

Presiding: C. H. Simmons, Yarnell Waring Co.

"Practice and Theory in Carbide Milling," Michael Field, Cincinnati Milling Machine Co.

"Recent Developments in Carbide Application," J. R. Longwell and Fred W. Lucht, Carboloy Co.

### Society of Automotive Engineers

Sept. 25 at Knickerbocker Hotel—7:30 pm.

Toastmaster: Stephen Johnson, Jr., SAE Vice President for Production Activity, and Assistant Sales Manager, Bendix Westinghouse Automotive Airbrake Co.

Coffee Speaker: C. E. Frudden, SAE President, and Consulting Engineer Allis Chalmers Manufacturing Co.

"A TRIP THROUGH THE MACHINE TOOL SHOW," Joseph Geschelin Detroit Editor, 'AUTOMOTIVE INDUSTRIES.'

# Production

(*Continued from page* 63)

to our entire economy. The rate for manufacturing only was 2.9 per cent per year, due chiefly to the steady increase in use of more and better machinery. Where can a like record be found?

In 1849, investment in industry per worker was $500 and horsepower per worker in power driven machinery was 1.3. By 1939 the investment figure had risen to $6,000 and the horsepower figure to 6.4. Charles E. Wilson, President of General Motors, recently said, "Increases in productivity are not automatic, nor are they, generally speaking, the result of increased effort by workers. They result from improved tools, new processes and new inventions and these come about because someone is willing to save part of his current income and risk it in financing new developments—all in the hope of making a profit." Adequate profits for industry. High wages for workers. These are the incentives which make the American system work in free competition and open markets.

How workers profit through increased productivity was shown by John T. Dunlop, Professor of Economics of Harvard, a short time ago at a round table discussion of the "Miracle" of Productivity sponsored by the National Industrial Conference Board. Said Professor Dunlop, "Wages tend to rise a little faster than the average in industries with the most rapid increases in productivity. Wages tend to rise less than the average in industries with less than average increases in productivity. Over long periods of time, the gains of productivity have been shared primarily in two main ways — rising levels of wages and salaries and lower prices or improved quality. The wage and salary level on the average seems to have risen during the past century just about as fast as the rise in productivity. The price level has remained relatively constant, with price declines in those areas in which productivity has increased most rapidly and with price rises where productivity has been increasing less rapidly.

"Since the early part of the 19th century, rising wages and reduced prices have been the principal means for distributing the gains of productivity. Both wages and quality of our output show a long-term tendency to increase. In the long run the rate of profit, however, seems to show no improvement.

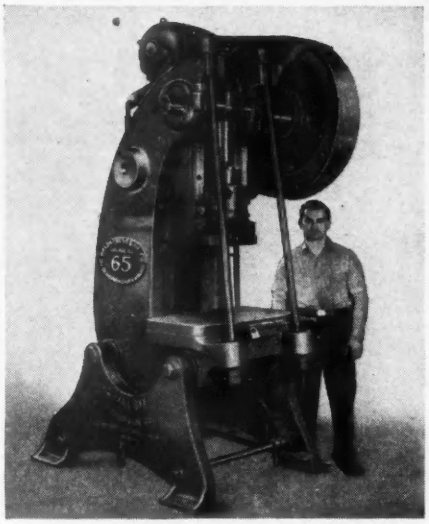
"In the short run, profits take a part of the gains of productivity. Under the competitive system 'excess profits' arising from technical change (above interest on investment and wages of management) tend to disappear in wage increases or price declines, including product improvements. These 'excess profits' under a competitive system could only be recreated by more technical changes."

Technical changes, improvements in methods, materials and processes, constitute a continuing need that is constantly being met. The makers of production equipment now have many new offerings. It is well that attention is being focused on them en masse at this particular time. Each is compelling in its silent demand that its possible application in the solution of some special production problem of today be most carefully and thoroughly considered.

## Sun Oil Completes $200,000 Plant in Mich.

A $200,000 pressure-maintenance plant to conserve crude oil in Norwich Field, Missaukee County, Mich., was completed recently for the Sun Oil Co. This plant was built as part of a $4 million oil and gas conservation program which was launched in early 1946. Designed to handle 3.5 million cu ft of gas a day, natural gas produced along with crude oil is collected and piped to the new plant, where it is compressed to over 2000 psi, and returned for maximum recovery of underground oil reserves.


The NEW Walsh Press Line!



No. 65 Press. This new 65-ton Walsh Press embodies advanced features which yield higher standards of press performance. Fully described in Bulletin 447.

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Inquire at Size Control Co.—Booth 401; and at Dayton Rogers Exhibit Booth 14-C

WALSH PRESS SAFETY DEVICE

Standard equipment on every Walsh Press and adaptable to presses of all makes. The Walsh Two-Button Safety and Non-Repeating Device assures absolute safety and eliminates the need of skilled operators. Shown and described in Bulletin 447.

Available Now—

O. B. I. PRESSES 6 TO 90 TONS

A 10-fold increase in production over the past two years makes most sizes of Walsh Inclinable Presses available from stock. Also horn presses, straight sided presses and special presses.

Note these characteristics of Walsh Presses:

**STRONG**—as pressmen put it, "Walsh Presses have plenty of guts." Walsh puts extra strength in the right places.

**ACCURATE**—all the precision "know how" of Walsh's affiliate, Size Control Co., is built into Walsh Presses.

**SPEEDY**—can be run at top speed because the parts are precision ground, balanced and surface finished to Brush Analyzer Standards.

**SAFE**—The Walsh Safety Device is but one of the features which give Walsh Presses a top safety rating.

**ECONOMICAL**—In terms of actual production, running time and maintenance, Walsh Presses show bottom ultimate cost.

**24-HOUR REPAIR SERVICE** — Walsh stocks a complete inventory of parts for all its standard and special presses.

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Engineering Representatives in Principal Cities

# More and Better Machines

(*Continued from page* 74)

spindles, carried in a rotating turret are driven by individual worms and index wheels that are synchronized with the turret rotation. The work spindles which carry the work holding outfits are held in aprons, the latter being provided with individual relieving mechanisms which withdraw the work from contact with the cutter when it is on the return or non-cutting stroke. Cutting is progressive from roughing to finishing in one operation and in one setting of the machine.

An addition in the gear tooth finishing category is a shaving machine that has two cutting stations and four work stations and incorporates the principle of crossed axes shaving. This machine centers about a four-sided turret equipped with four sets of head and tailstocks to carry work gears with their axes vertical. Two cutter heads spaced 90 deg apart automatically move the shaving cutters simultaneously into mesh with their respective work gears on adjacent turret faces. After completing the cutting cycle, the cutting heads automaticaly go out of mesh and the turret indexes 180 deg to present two fresh gears to the cutters and repeat the cycle.

### *Automatic Crankshaft Milling*

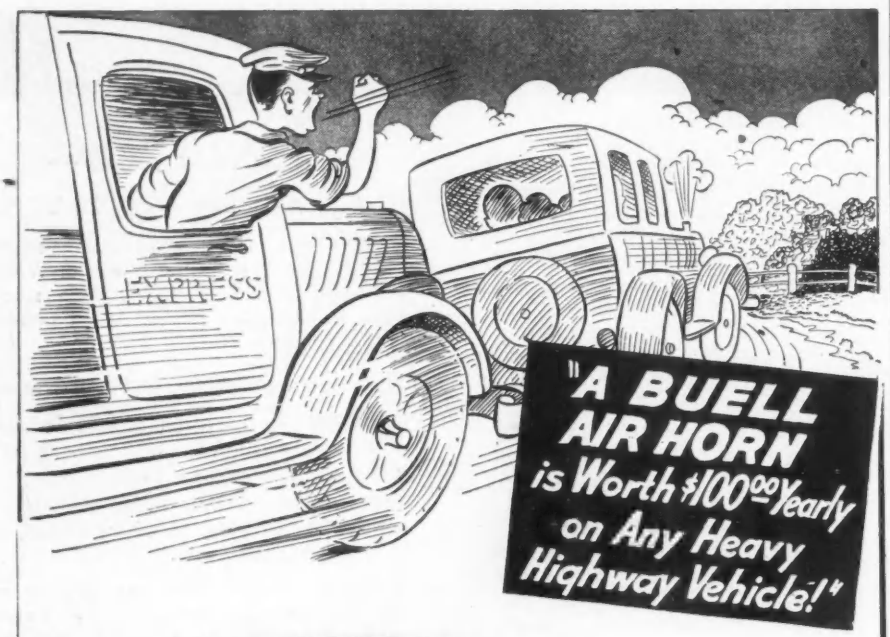
For the machining of crankshafts there is a special new turn milling machine designed to turn mill simultaneously all the crank pins and face the adjacent cheeks and counterweights on a crankshaft to a finish ready for grinding. In operation the machines two headstocks—which together with their respective multiple master cams are driven in unison from a common drive—rotate the crankshaft. Each cam, mounted rigidly to a work rotating spindle, controls the movement of three 24 in. diam milling cutters through hydraulic means, acting on the cutter slides. The six crank pins are each in turn milled by one of the cutters which is driven by its own 25 hp motor. The slides moving in unison with the master cam, follow the crank pins around their orbit while the crankshaft is rotated around its own axis. Four of the cutters move only in a vertical plane, the other two in a horizontal plane; these latter also have a sidewise movement to facilitate loading and unloading.

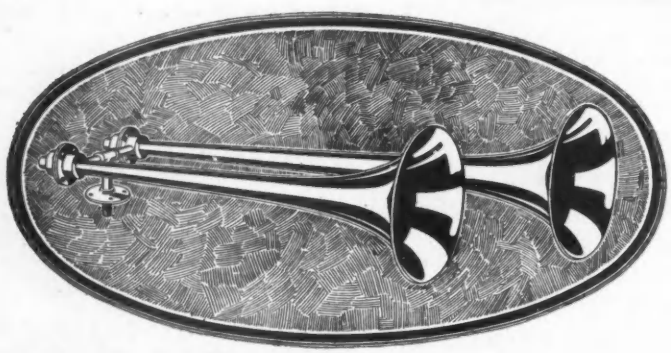
An advancement in cylindrical grinding practice is an internal grinder equipped with a comprehensive hydraulic and electronic control arrangement that provides for complete selective, infinitely variable cycles. The machine is designed so that the full grinding cycle proceeds automatically and the operator's attention is required only for loading and unloading the work and tripping the valve to start the cycle. The machine then operates automatically through the following cycles: rough grind, true wheel, finished grind, and return to chucking position as finished size is reached.

### *New Inspection Equipment*

Electricity and air are being put to work on a variety of types of gaging and testing devices. An electronic micrometer, making use of the magnetic field distribution about a coil excited by high frequency currents in the presence of a metallic plate, records measurements to 0.0001 in. This instrument may also be used as a tachometer. Another application of electronics is in a device which automatically sorts small parts into three classifications, oversize, acceptable and undersize. Said to be accurate to 0.0001 in., this selector will sort parts with tolerances from plus or minus 0.0001 in. to plus or minus 0.005 in. at speeds up to 12,000 parts per hr. Not content with measuring a relatively large specimen of steel for hardness, one enterprising laboratory developed an instrument that can measure hardness of microscopic grains

(*Turn to page* 174, *please*)

- *Buell Air Horns are tops in warning signal efficiency.*
- *Installed as original equipment on many Trucks and Buses.*
- *They reduce maintenance costs by decreasing stops, starts and slowdowns.*
- *All records prove that they save tires, brakes, clutches and gears.*
- Cut gas and oil consumption.

With a Buell the driver has greater security, maintaining a steady cruising speed. Slowing a 20 ton load from 50 MPH to 30 MPH means destroying a lot of energy thru brake lining and tires. It is replaced by burning more gasoline, increasing load on engine and tires again, to regain speed. This all costs money. We believe a Buell Air Horn is worth $100.00 yearly on any heavy highway vehicle. Then remember a Buell will last more than 10 years. How would you rate a $100.00 investment that earned $100.00 yearly for 10 years. Ask the man who has a Buell.

**BUELL MANUFACTURING CO.**

**2975 Cottage Grove Ave., Chicago 16, Ill.**

# turn out better castings . . . Faster!

**SPEED . . .** lots of it! — is engineered into the Wickes No. 4 Die Casting Machine for lead, tin, and zinc alloys. This automatic machine will produce high quality large castings like the automobile dashboard grille illustrated, *at a faster rate than any other machine of its size.* Dies open and close at 750" per minute, with a momentary slowdown just before closing. Die opening adjustable from 6 to 16 inches. As many as 600 shots per hour—up to 25 lbs. zinc each—are injected at pressures of 1,500 to 6,000 P.S.I. Lightning-fast accumulator eliminates auxiliary air compressors and nitrogen flasks. Distance between bolster plate and platen is easily adjusted from 9 to 23 inches with one lever—*no time-wasting adjustment of tie bars to install new dies.*

In addition to greater speed, the Wickes No. 4 Die Casting Machine has dual melting pots that permit closer control over metal temperature . . . hardened and ground alloy steel tie bars for maximum strength and rigidity . . . toggle mechanism which transmits up to 400 tons pressure without strain or shock . . . provision for core pullers. *Write for descriptive literature and complete facts.*

**WICKES BROTHERS**

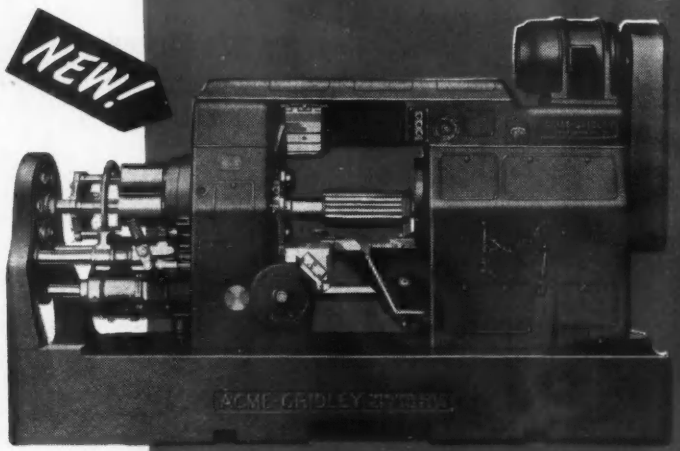
*Recognised quality since 1854*

**SAGINAW, MICHIGAN**

# See these NEW National Acme

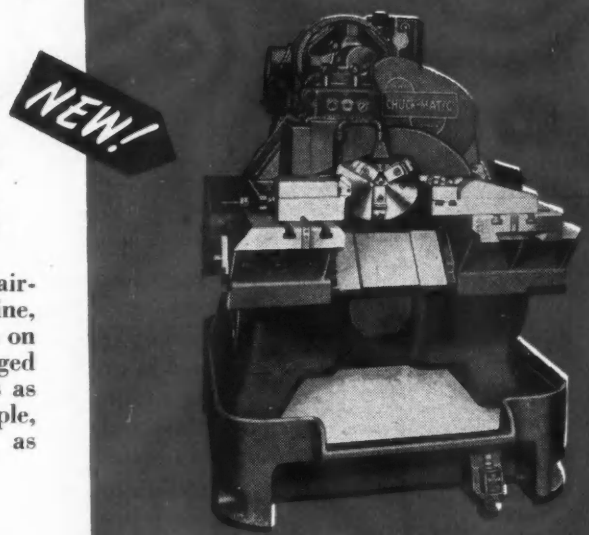
## FOR LOWER COSTS ON AUTOMATIC BAR WORK

The new 1¼" Model RB Acme-Gridley Six-Spindle Bar Machine offers three basic time and moneysaving advantages: It's heavier, more powerful—for today's increased speeds and feeds. It's more versatile—will handle more operations (including many second operations)—at a lower machine investment, with less handling, lower machining costs. And it's easier to operate—to give maximum man-hour output, compensating for increases in other costs.




## FOR INCREASED PRODUCTION ON CHUCKING OPERATIONS

The new Acme-Gridley 12" Chuck-Matic is an air-operated, single-spindle, automatic chucking machine, especially suited for heavy-duty, high production on castings, forgings and tubing parts. It's built rugged—and powerful—to operate at speeds and feeds as fast as carbide-tipped tools can take it. It's simple, compact, easy to operate—one man can run as many as four machines.



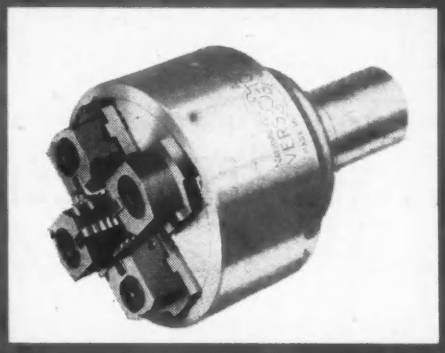

**NATIONAL ACME AT THE MACHINE TOOL SHOW ALSO WILL DEMONSTRATE 4, 6, AND 8 SPINDLE BAR AND CHUCKING AUTOMATICS AND OTHER STANDARD PRODUCTS**

# Production Profit-Builders at the Show

NEW!

## FOR HIGH-SPEED PRECISION THREAD AND FORM ROLLING

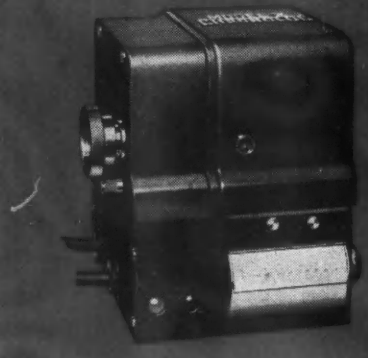
The new Namco Roll-Matic is a triple-roll hydraulic thread and form rolling machine, built to cut your costs on all standard pitch threads in sizes from $\frac{3}{8}$" to $1\frac{1}{2}$". Operation is simple, dependable—and versatile. The three rolls, backed up by powerful, straight-line camming, give positive, equal pressure—resulting in smooth threads, close fit (class 3 fits are easily attainable)and no distortion, even on hollow work.



NEW!

## FOR MORE ECONOMICAL THREAD-CUTTING PRODUCTION

The new adjustable-blade chasers bring even greater versatility to standard Namco self-opening Vers-O-Tool die heads. These new chasers are especially suited for shorter runs, where they minimize tool investment. Adjustable chasers cover the range of the six standard Vers-O-Tool heads for capacities from $\frac{3}{8}$" to $1\frac{5}{8}$", and are interchangeable with circular chasers, size for size. Positive adjustment for bringing the cutting edge up to proper position after each regrind—and more grinds per chaser—are outstanding advantages.



NEW!

## 10% MORE PRODUCTION ON ANY MACHINE

The Chronolog is National Acme's automatic, electric means of providing accurate, indisputable information on machine performance. Approved by management and labor alike, it gives a complete production record, telling why, when and for how long any operation was down during the shift. Without exception, users report a minimum of 10% increase in production after installing the Chronolog.

## The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

Meet us at
**BOOTH 628**
MACHINE TOOL SHOW
CHICAGO—SEPT. 17-26

## Handle Scrap *Faster—Easier*

This Burro is handling scrap faster and easier because it moved itself and several cars to the job quickly—and started work without delay. Burros equipped with magnet, clamshell bucket, dragline bucket, tongs or hook are saving time and money on many jobs in every type of industry. Their powerful draw bar pull (7500 lbs.) and fast travel speeds (up to 22 MPH) make them efficient switch engines too—you can spot cars where and when you want them at a moment's notice. There's no waiting time when a Burro is on your ***track.*** CULLEN-FRIESTEDT, 1322 S. Kilbourn Ave., Chicago 23, Ill.

***Write for Descriptive Bulletins***

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.


## Better Machines

(*Continued from page* 170)

of steel, and thus permit the study of hardness gradients within very small areas. The mechanism consists of an indentor with a square base diamond pyramid penetrator, a mechanical stage for holding the specimen, a microscope capable of magnifying the test field 500 to 1500 times, and an electric control box. As many as 60 indentations may be made automatically at predetermined time intervals for surveying tiny gradients.

A difficult inspection situation is that involved in discovering flaws in ferrous tubes or cylinders. A new method for exploring such inaccessible surfaces is made possible by an instrument in which use is made of an electromechanic pickup coil, sensitive to the magnetic leakage caused by flaws in steel magnetized by direct current and connected to an electrical indicator or recorder.

Electricity and air are used together by the manufacturer of an automatic gaging machine that checks the average outside diameter of cylindrical parts. Parts are placed in a chute by an operator and proceed under an electric gaging head, which actuates devices that automatically reject any excessively oversize parts. The remainder

(*Turn to page* 178, *please*)


# FAIRFIELD

NO MATTER how special your requirements may be, Fairfield can help you solve your gear production problems efficiently . . . and economically. Fine manufacturing facilities, large production capacity, and some twenty-eight years of engineering experience have made Fairfield a leader in supplying gears for tractors, trucks, buses, machine tools, engines, and all kinds of automotive, aviation, agricultural, construction, marine, and industrial equipment. CHECK WITH FAIRFIELD ON YOUR NEXT GEAR REQUIREMENTS.

FAIRFIELD
MANUFACTURING CO.
319 South Earl Avenue
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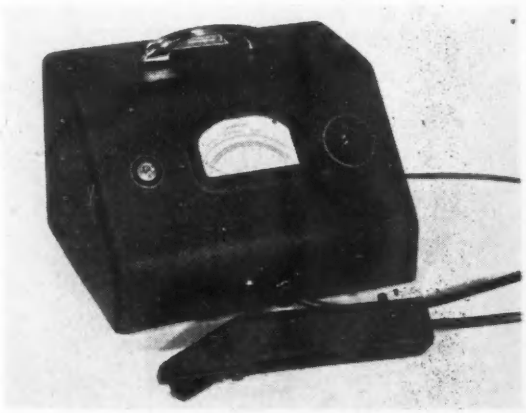
For FINE GEARS

YOU CAN NOW
## SIMPLIFY SURFACE INSPECTION
*on the Production Line*



The Model A Pico Comparator provides a rapid, convenient and portable means of controlling surface finish of bearings, machined surfaces, thread flanks, ball bearings, etc.

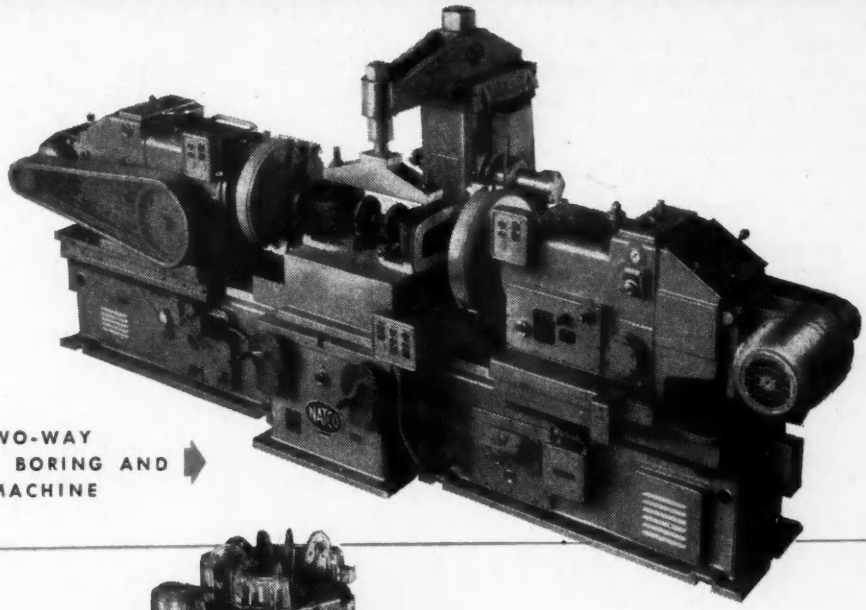
Light weight, simplicity of operation and reasonable price permits a wide range of applications.

Write or wire for information concerning your special problem of surface finish control.

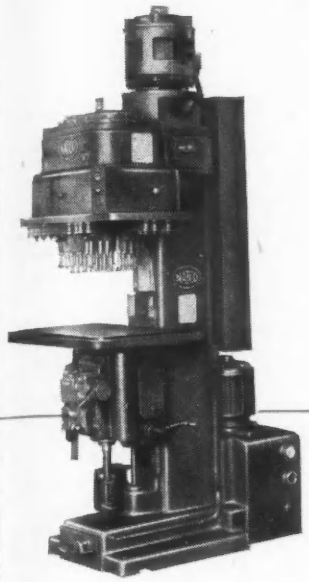
**PHOTRON INSTRUMENT COMPANY**
**5713 EUCLID AVENUE, CLEVELAND 3, OHIO**

# types of DRILLING, BORING, TAPPING and FACING machines

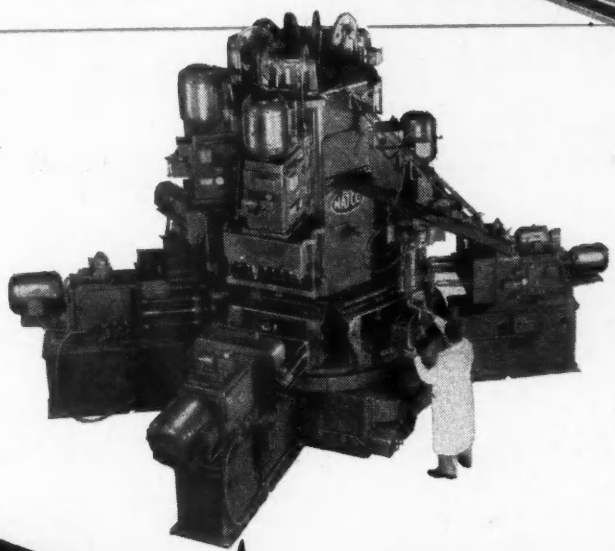
**AND QUALITY WORKMANSHIP BACKED BY NEARLY A HALF CENTURY OF EXPERIENCE**



NATCO TWO-WAY TURNING, BORING AND FACING MACHINE



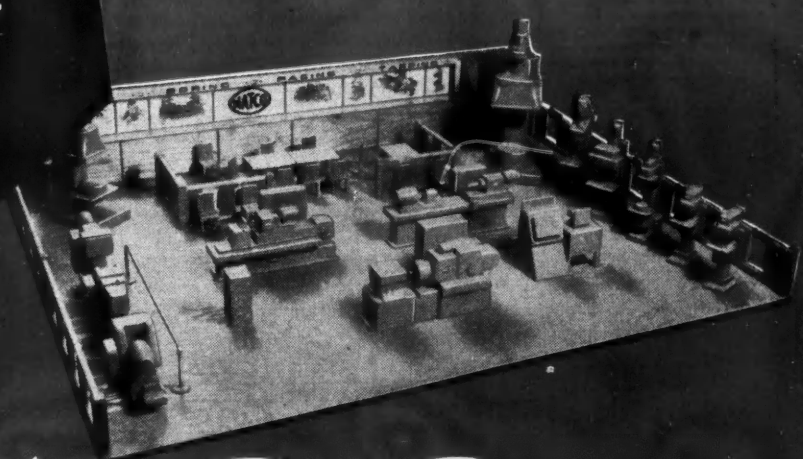
NATCO HIGH SPEED SENSITIVE DRILLER AND TAPPER



NATCO STATION TYPE MACHINE

*See our Booth NO. 4*

AT THE NATIONAL MACHINE TOOL BUILDERS ASS'N. SHOW
SEPT. 17TH THROUGH SEPT. 26TH AT CHICAGO



**NATCO**

*Call a Natco Field Engineer*

# More and Better Machines

(*Continued from page* 174)

of the parts are removed from the gaging station and inserted in a tungsten carbide air ring. The air ring is connected to a series of air-electric gaging heads that determine the size of the part and lights one of the individual signal lights located directly behind the chute. Each of the lights has a prearranged color band around the diffusing lens to indicate the size of the part. The lights come on only if the part is within the minimum and maximum tolerance limits. Parts are ejected from the air ring, segregated and classified as to undersize, oversize, or one of five acceptable classifications. Depending on the efficiency of the operator, between 500 and 700 parts can be inspected in an hour.

### *Metal Powder Presses*

The use of new materials, such as synthetic plastics and powdered metals, has called forth new machines and tools for their production. A fully automatic press for compacting metal powders has been designed in which independent cams control synchronized movements of both upper and lower punches. This press is equipped with a compound lower punch designated to operate either as a secondary lower punch or as a movable core rod; if desired, this mechanism can be locked in place to serve as a stationary core rod. Another machine builder has put on the market a briquetting press that extends metal powder application to large, irregular surface cross-sections by embodying an operating principle that combines the advantage of triple hydraulic lower motion floating die table, core rod and stripper. Uniform density throughout finished parts is said to be assured by the hydraulically controlled floating die table and core rod rams, which recede against pressure that is pre-determined by simple, independent adjustments.

For extending the use of powdered metals and ceramics, one machine manufacturer has placed on the market an automatic mechanical press which operates with a vacuum chamber built around the dies, feed hopper and discharge chute. It permits the compressing of very fine powders that cannot be worked satisfactorily at atmospheric pressure. The production rate with ceramic powders is said to be raised from 10 tablets at atmospheric pressure to 40 per minute under vacuum. Another development in making small parts from powdered metals is the application of the extrusion technique in restriking the sintered part, which results in lower cost and closer tolerances than with conventional tools.

For the forming of plastics one machine tool company incorporates the use of a single hydraulic cylinder in a vertical injection press. This arrangement provides for stamping the mold halves together and injecting the plastic material into the mold cavity in the same stroke of the piston rod. The piston is hydraulically powered by a self-contained hydraulic unit which forms an integral part of the machine. Anticipating the need for quick changeover, easy accessibility has been a big factor in the construction of this machine; changeover can be made in about 20 minutes. This feature makes it practicable to have a supply of heated cylinders for different plastic materials.

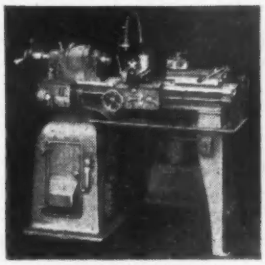
### *High Speed Punch Press*

A revolutionary design high speed punch press operating at speeds up to 1800 strokes per minute, employs the use of a rotary motion in actuating upper and lower dies. Four crankshafts, without conventional flywheels, are used; the upper two, rotating clockwise, drive the upper die head, while the lower pair, counter-lockwise in motion, drive the lower die head. The die members, mounted in anti-friction die sets, are located between the two die heads, the punch holders being fas-

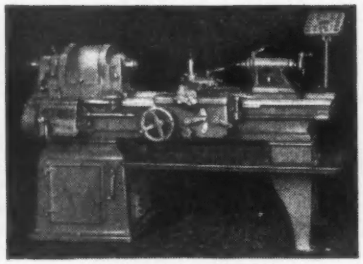
(*Turn to page* 181, *please*)


SOUTH BEND *Precision* LATHES

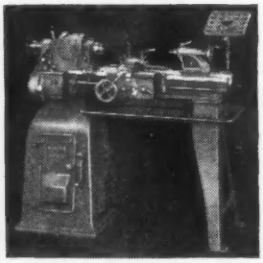
ENGINE LATHES · TOOLROOM LATHES · TURRET LATHES · ATTACHMENTS



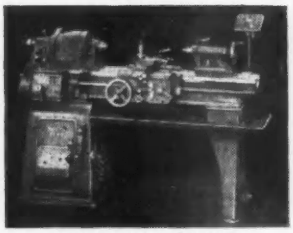
No. 1006-Z SOUTH BEND TURRET LATHE $1147



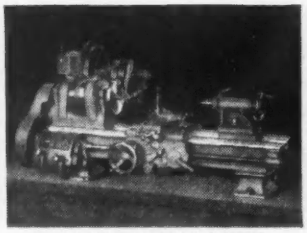
16" x 6' SOUTH BEND TOOLROOM LATHE $1958



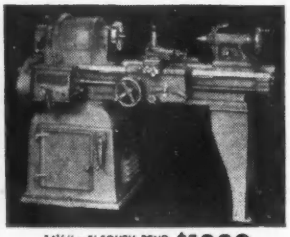
10" x 3½", 1" COLLET SOUTH BEND TOOLROOM LATHE $1116



13" x 5' SOUTH BEND TOOLROOM LATHE $1418



9" x 3' SOUTH BEND MODEL A BENCH LATHE $270



14½" x 5' SOUTH BEND ENGINE LATHE $1309

WRITE FOR CATALOG

Illustrates in full color, and gives complete, detailed specifications of all types, sizes, and models of South Bend Precision Lathes; shows all South Bend lathe attachments and accessories. Mailed free on request.

*A Size and Type for Every Need*

Accurate, versatile, fast, and easy to operate, South Bend Precision Lathes simplify the handling of difficult, close tolerance jobs in all types of laboratory, toolroom, production, and maintenance work. Practical South Bend attachments and accessories increase the scope of these lathes, and speed tooling and production.

South Bend Engine Lathes and Toolroom Lathes are made with 9", 10", 13", 14½", 16", and 16/24" swings, and bed lengths to 12'. Turret Lathes are made with 9", 10", and 16" swings, ½" and 1" collet capacities. Prices listed f.o.b. factory; less electrical equipment, coolant pump, and bench. Average price increase less than 15% over prewar level. Immediate delivery—time payment plan available.

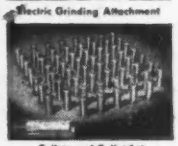
Electric Grinding Attachment

Draw-in Collet Attachment

Draw-in Collet Attachment

Center and Follower Rests

Telescopic Taper Attachment



Collets and Collet Sets

Handlever Bed Turret

Square Turret Tool Block

Double Tool Cross Slide

Double Tool Cross Slide

SOUTH BEND LATHE WORKS

*BUILDING BETTER LATHES SINCE 1906*

512 EAST MADISON STREET · SOUTH BEND 22, INDIANA

# More and Better Machines

(*Continued from page* 178)

tened to the upper head and the die holder to the lower die head. The punches and dies, therefore, have the same rotary motions as their respective die heads, closing and opening in each cycle of the crankshafts, giving the advantage of cutting the stock while it is actually in horizontal motion (cutting the stock as it goes by).

A new departure in percussion press design introduces hydraulic pressure for moving the slide and makes possible rapid production of hot forgings of steel, brass, and aluminum in a wide range of shapes. The operating principle of this 600 ton press employs a flywheel at the top of the vertical screw which is brought to speed by hydraulic pressure and utilizes the accumulated energy developed to deliver a quick, hammer-like blow, uniform in power.

### *Welding Advancements*

Many substantial advances have been made in welding processes with full automatic, high output units appearing in ever increasing numbers. Flame cutting has made great advances; it is now possible to cut through steel billets up to 50 in. thick. There are various types of pantograph machines; one of particular interest, using an electric eye unit, effects tracing by a tiny light beam following a profile laid out in black against a white background. The cutting field is profiting from the use of a combination of gas and arc welding involving the use of a tubular steel, coated rod from which the arc is struck. Helium shielded arcs, used for some time in the welding of magnesium, have been extended to the welding of stainless steel.

Arcwelding is more than holding its own and is steadily finding new applications. Only a few of the many new developments can be cited here. A new electrode has been developed for simplifying the welding of high sulfur, free machining steels and of certain high tensile, low-alloy steels. There is also a high carbon electrode for building up worn steel parts by welding with low-voltage a-c transformers, as well as d-c. Another improvement is a shielded arc electrode for building up straight carbon steel, low alloy steel or hard manganese steel with a self hardening deposit. Although designed for a-c current, it may be used with d-c as well. Portable arcwelding units are available in a wide range of sizes. These new machines feature rugged construction, weather-proofing, simplicity and flexibility of operation, and low operating cost.

### *Automatic Welding Machines*

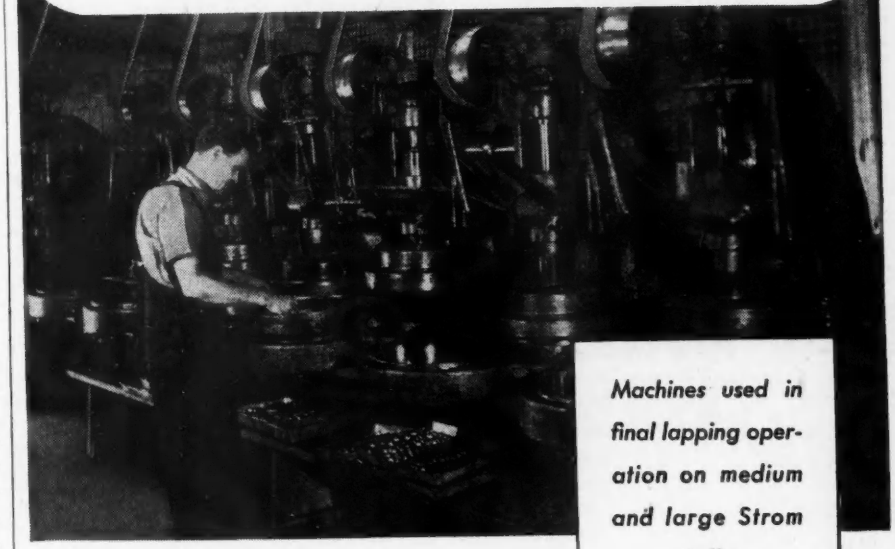
The development in automatic electric spotwelding machines has led to the use of multi-transformers which permit variations in weld characteristics. One such machine can make a total of 12 welds simultaneously, or half the guns in one unit can weld simultaneously followed immediately by the other half, or guns can weld in pairs, one pair after another. Other automatic welding machines are being made in contact point or disk welding types. These machines, built for welding small parts, are assembled to a table approximately the size and appearance of household ironing machines and may be operated from a sitting position. Battery powered welding machines are now available and are proving to be highly efficient. Tremendously high discharges are obtainable from the power pack unit for the brief time needed to make a weld, while the batteries are kept up by a continuous charger unit which places no greater load on the lines than occasioned by a standard 10 or 15 hp motor.

As a result of improvements in forging production techniques, forgings are becoming available for a wide variety of applications. In some instances complicated parts are fabricated by forging components and welding them to-

(*Turn to page* 182, *please*)


Surface • Sphericity • Precision

STROM BALLS



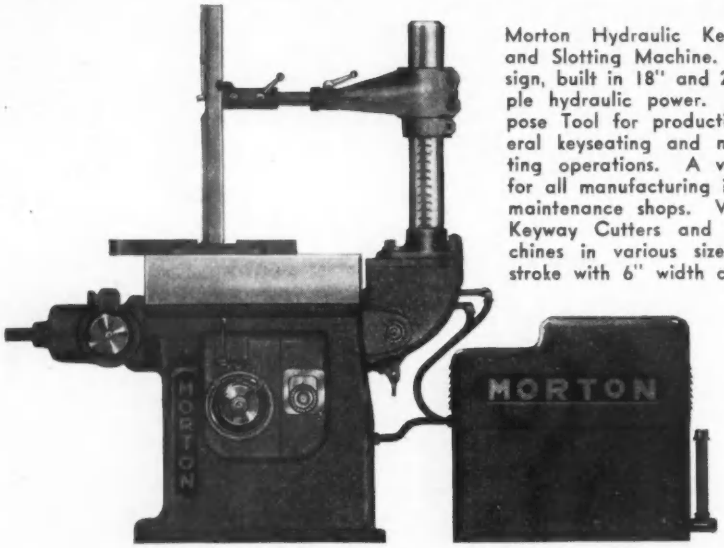
*Machines used in final lapping operation on medium and large Strom Balls.*

It takes a long series of processes, developed and perfected over a period of years, to make a thing as faultless in material and form as a Strom Metal Ball. Worked to a tolerance of fifty millionths of an inch, their outstanding qualities of finish, sphericity and precision have made Strom Balls the standard of industry. Strom Steel Ball Co., 1850 South 54th Ave., Cicero 50, Illinois.

Strom BALLS Serve Industry

Largest Independent and Exclusive Metal Ball Manufacturer

# These New **MORTON** Draw Cuts Will Be Featured at the Machine Tool Show, Booth 120




Morton Hydraulic Keyway Cutter and Slotting Machine. New in design, built in 18" and 24" sizes, ample hydraulic power. A Multi-purpose Tool for production and general keyseating and numerous slotting operations. A valuable asset for all manufacturing industries and maintenance shops. We also build Keyway Cutters and Slotting Machines in various sizes up to 72" stroke with 6" width capacity.

Morton Hydraulic High Duty Draw Cut Flash Trimmer. New in design, built in sizes from 12" to 36" trimming capacity for removing the flash or upset from both sides of resistance or butt welded sheets cylinders or special shapes in one operation. Our rams automatically adjust themselves to variation in metal thicknesses.

Also Hydraulic Light Type from 3" to 12" trimming capacity. Medium type mechanical drive for sheets and cylinders to 68" wide and sheets to 100" wide. Heavy Duty Rolling Mill Type Trimmer from 18" to 96" width capacity for continuous strip sheet and plate production.

***We will exhibit Morton Finished Machine Keys and Special Shapes, also photographs of many new Morton Draw-Cut Machine Tools and Special Machinery. Visit us at Booth 120 at Dodge Chicago Plant September 17th to 26th.***

## MORTON MANUFACTURING COMPANY

*Muskegon Heights, Michigan*


# More and Better Machines

(*Continued from page* 181)

gether into a complete unit.

The foundry industry, in many cases, is realizing improvements through the employment of consultant engineers who are specialists in foundry practice. Investigation and experimentation are laying the ground work for increased efficiency in the production of sand cores by the pneumatic blowing of sand into core boxes through the application of semi-portable bench blowing machines, and electronical baking of cores. Production is being expedited also through increased applications of mechanical conveyor systems. In addition to these trends, a noteworthy technical development is a synthetic molding sand which is said to have excellent molding plasticity and lasting properties.

### *Conveyor Techniques*

Technical advances in the conveyor manufacturing industry are concerned more with the technique of using conveying equipment than with changes in design of conveyors. Installations must be tailored to fit the needs of the user, hence, the conveyorizing of one plant cannot be duplicated in its enirety in another. The growth of the conveyor equipment industry is shown in Fig. 3.

Improvements in machine tools and machining techniques have been made all along the line. Mechanization is being applied increasingly in foundries, heat treat, plating, and painting departments. Summing up trends, advancements in machine tool design and machining techniques point toward wider use of all types of automatic control devices; automatic control of sizing such as used on grinders and honing machines; increased applications for cemented carbides for cutter bits; wider use of broaching techniques; improved quality of machines through harder contact surfaces, anti-friction bearings, increased power and greater rigidity to withstand the increased loads; automatic loading and unloading devices; completely automatic machines such as the transfer-line system. More and better machines, tools and techniques coupled with intelligent personnel policies are effecting greater productivity of workers; today increased production does not depend entirely on increased units of man power. Increased mechanization releases worker from long hours of toil, affording more time for leisure pursuits, ultimately liberating him to enjoy the many fruits he has been enabled to bring forth with less physical effort than ever before.

Gisholt Automatic Turn-Milling Machine for crankshaft bearings
Ingersoll Vertical Spindle Milling Machine
Gisholt Superfinishing Machine
Kearney & Trecker Precision Boring Machine
W. F. and John Barnes Special Drilling Machine
Barber Colman Automatic Hob Sharpening Machine
Hoefer Drilling Head
"PERFECT" OIL SEALS for MAXIMUM EFFICIENCY
Adhering to the above policy helps these outstanding machine tools and many others to produce at the pace and with the accuracy required by modern industry.
"PERFECT" Oil Seals
PATENTED
CHICAGO RAWHIDE MANUFACTURING CO.
69 Years Manufacturing Quality Mechanical Leather Goods
Exclusively and Now Sirvene Synthetic Products
1310 ELSTON AVENUE • CHICAGO 22, ILLINOIS
PHILADELPHIA • CLEVELAND • NEW YORK • DETROIT • BOSTON • PITTSBURGH • CINCINNATI
Manufactured and Distributed in Canada by SUPER OIL SEAL MANUFACTURING CO., Ltd. — Hamilton, Ontario
2804
Gardner Double Spindle Precision Grinder
Gisholt Saddle Type Universal Turret Lathe

## NEW MACHINE TOOLS AND PRODUCTION EQUIPMENT

*For additional information regarding any of these items, please use coupon on page 120*

(*Continued from page* 119)

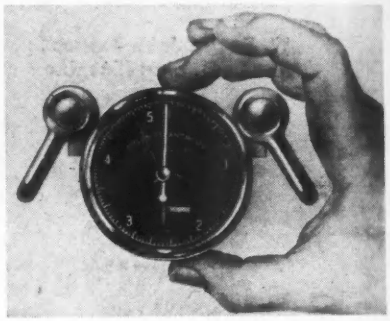
a small motor-driven compressor having a discharge pressure of 20 psi which eliminates the need of using existing high-pressure air lines and pressure regulators. Because of its finely-divided state, the oil mist can carry long distances through connecting lines without separating out or collecting in pockets. As many as 12 machines can be serviced by one lubricator without lowering of pressure.

### F-82—Gage Guard Blocks

Johansson Division Ford Motor Co., Dearborn, Mich. Sintered tungsten carbide guard blocks for Johannson gage blocks. Extra wear and protection for Johansson gage blocks has been achieved by use of sintered tungsten carbide guard blocks of super hardness. The guard blocks come in thicknesses of 0.100 in. and 0.050 in. and are available in both the A and B standards of (plus or minus) 0.000004 in. and 0.000008 in. The guards are simply wrung on to the end of any Jo-block combination and will fend off virtually all of the impact and abrasion of any gaging job. The gage blocks are fabricated from the finest stabilized steel and with the addition of the guards their usual long term of service will be enormously lengthened.

### F-83—Miniature Dynamometer

W. C. Dillon & Co., Chicago 44, Ill. A miniature dynamometer, said to be the smallest of its kind, to measure tention or force in those "tight" spots found in many types of mechanical assemblies. The case is only three in.

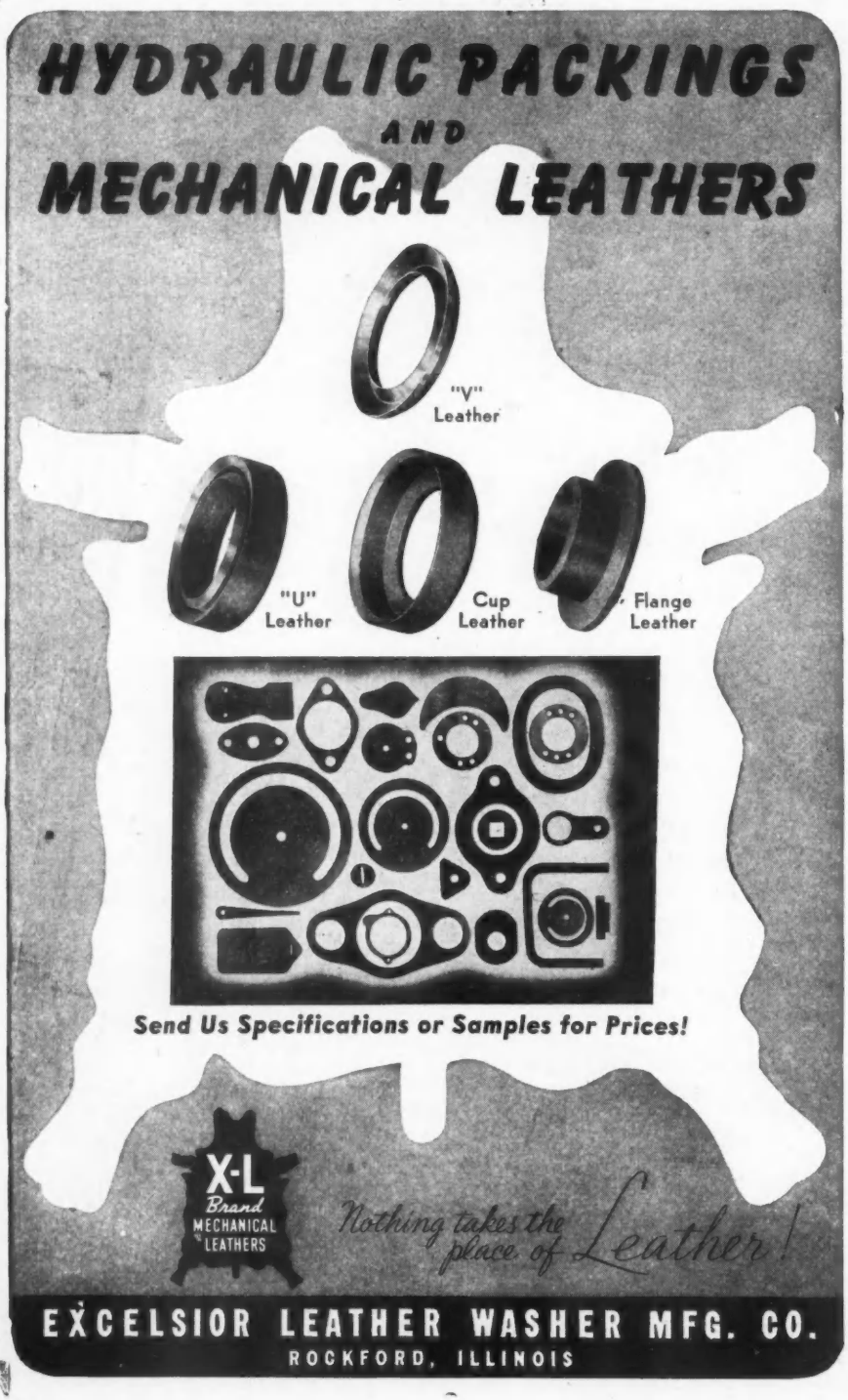


*Dillon dynamometer*

in diameter and the whole instrument weighs but one lb. It is available in 100, 250 and 500 lb capacities; has an unbreakable lucite crystal, and red maximum hand. The dial is black with etched silver numerals. Components are die cast of Zamac No. 3 alloy.

The company also makes the larger model AN dynamometer for measuring forces up to 20,000 lb, identical to the small model in every detail but size.

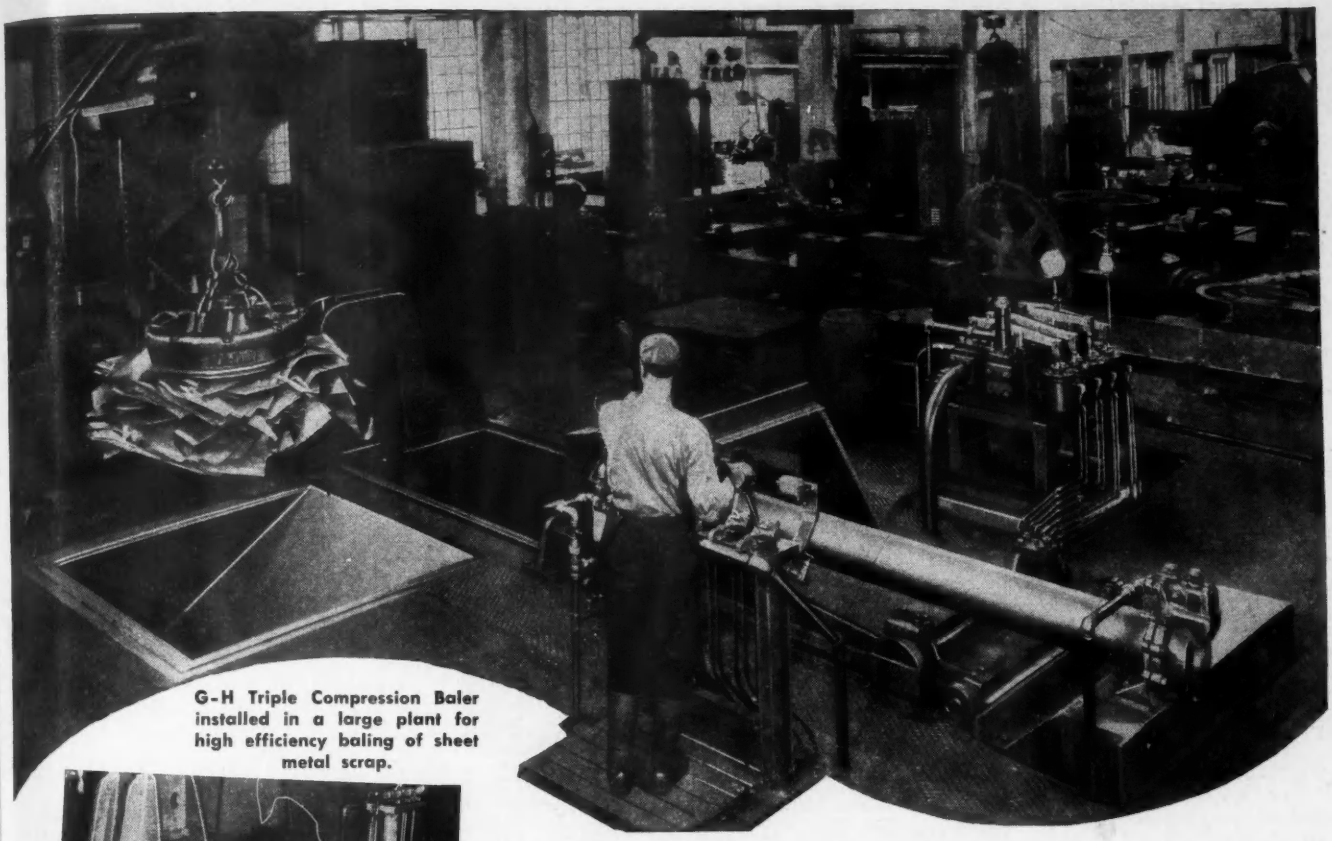
**New machine tools and production equipment received too late to be included in this issue will appear in the Sept. 15th issue of AUTOMOTIVE INDUSTRIES.**

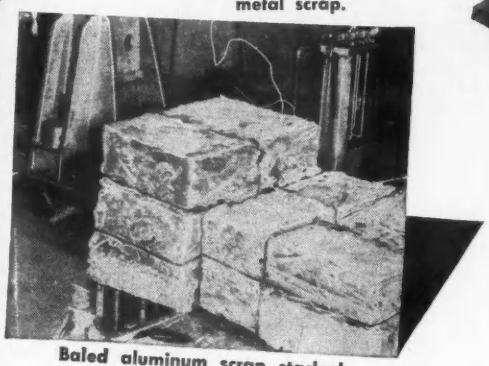


### Classified Advertisement

AUTOMOTIVE ENGINEER to completely design and construct small automobile similar to Austin or Playboy. Must know all sources of material supplies, supervise purchasing, labor costs to final assembly. Please furnish full particulars with photos. If interview is arranged expenses to New York will be paid. Box 91, c/o Automotive Industries, 5601 Chestnut St., Philadelphia 39, Pa.



G-H Triple Compression Baler installed in a large plant for high efficiency baling of sheet metal scrap.



Baled aluminum scrap stacked on skids for easy loading.

Finished bales carried to cars by conveyor.

# Baled Sheet Metal Scrap is Vital to Production . . .

A steady, adequate flow of properly prepared scrap metal, both ferrous and non-ferrous, to the mills, smelters and foundries is highly essential to meet the increasing demand for new metal and castings. Today it is indispensable in maintaining high-level industrial production.

A most desirable type of "scrap" is *sheet metal scrap* in the form of dense, compact bales . . . correctly sized and classified. It can be used immediately, without extra handling or preparation, to charge furnaces or cupolas. That's why it always commands premium prices.

If your daily accumulation of sheet metal stampings or clippings amounts to 5 tons or more, you will find it profitable to bale it the G-H way. Furthermore, you will be contributing to your own continuous supply of new metal!

*For experienced Counsel on your Baling Problems, consult—*

**GALLAND-HENNING MFG. CO.**
**2747 S. 31st STREET • MILWAUKEE 7, WIS.**

. . . builds Hydraulic Scrap Metal Balers in a complete range of sizes and capacities from ¼ ton to 20 tons per hour and more.

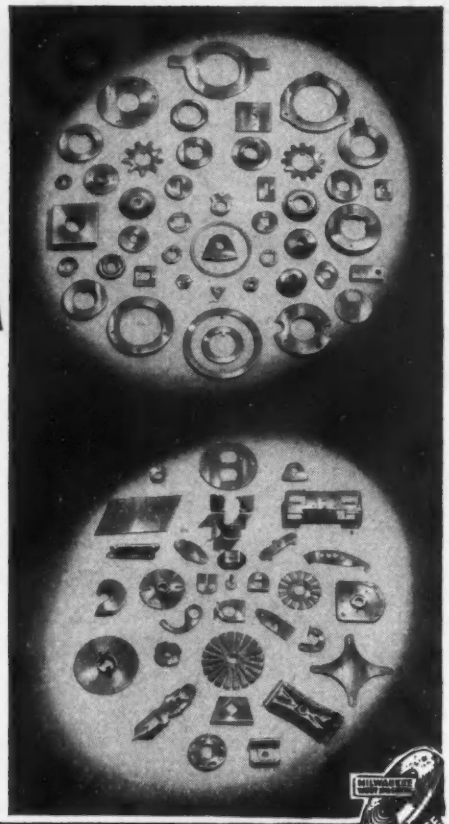
# GALLAND-HENNING

## SCRAP METAL BALING PRESSES

A5247-1P

60 YEARS OF SERVICE to INDUSTRY

SUPPLYING
WASHERS
and
STAMPINGS
OF EVERY DESCRIPTION
FOR EVERY PURPOSE...
UTILIZING MORE THAN
22,000 SETS OF DIES
Let Us Quote On Your Needs!



WROUGHT WASHER MFG. CO.
SINCE 1887
THE WORLD'S LARGEST PRODUCER OF WASHERS
2212 E. BAY STREET • MILWAUKEE 7, WISCONSIN

FIND OUT HOW
MOLINE
SPECIALLY DESIGNED
MACHINE TOOLS
can cut production costs
at the
MACHINE TOOL SHOW
in Chicago • Booth No. 128

MOLINE TOOL CO.
HOLE-HOG
MOLINE, ILLINOIS

MOLINE TOOL CO.
Moline, Illinois

# General News

(*Continued from page* 71)

## Lead

A nice balance between lead supply and demand has been achieved. Full requirements are being obtained, but with no surplus supply remaining. The rise in scrap recovery from 30,000 to 40,000 tons a month is not expected to last too long. Production is more or less static with no anticipated increase in the output of mines in current operation, and with no expectation that new mines are going to be opened.

## Zinc

The word is all quiet on the zinc front with all grades in ample supply. Marginal producers who had been banking on the enactment of the two year $70 million subsidy bill for copper, lead, zinc and manganese, and who had opened their workings in anticipation, will now be forced to close in many cases because of the President's veto of the bill.

## Patent New Engine

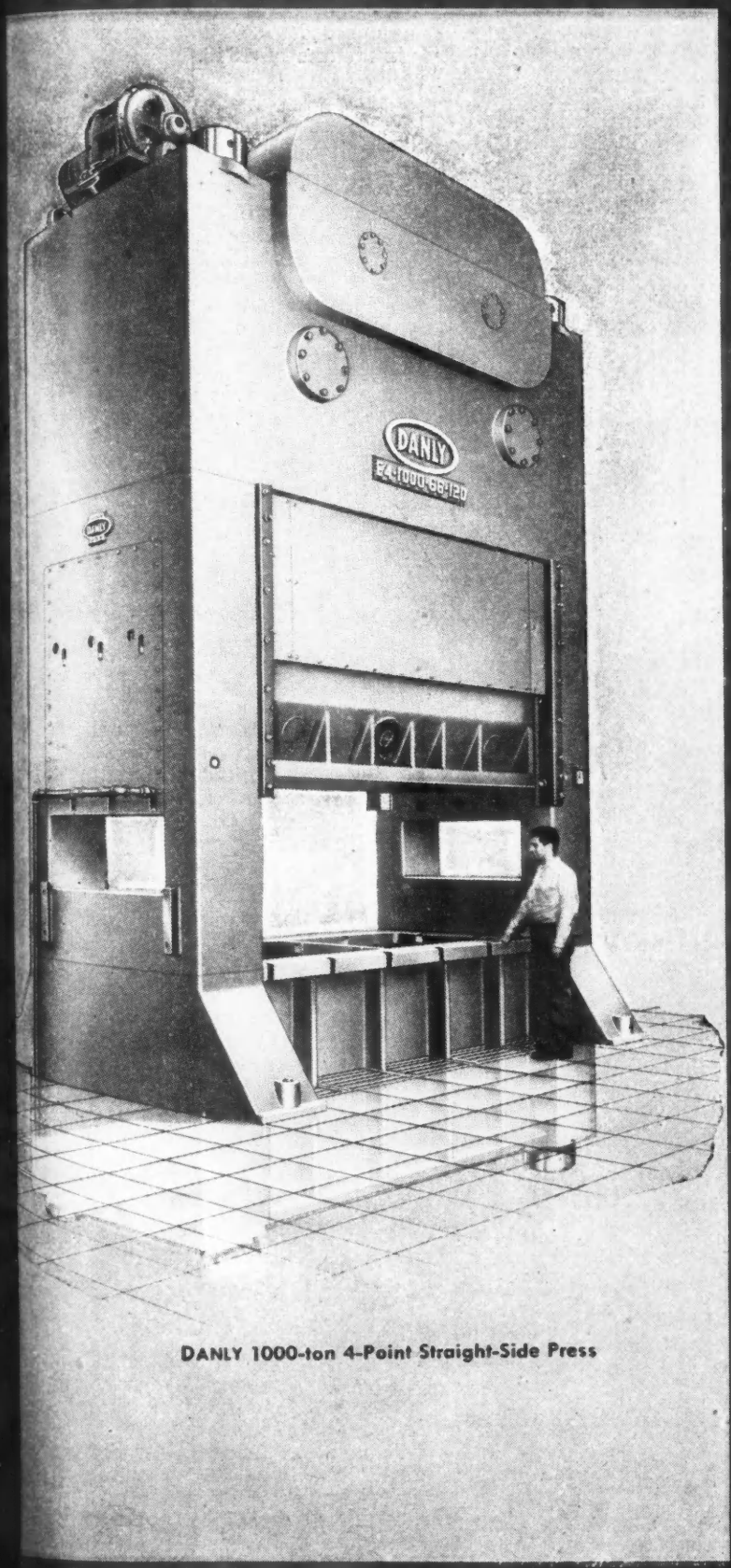
Employing features of gasoline and Diesel engines, Patent 2,424,723 has been granted to Carman C. Tate of Mexico City for a new internal combustion engine. The new engine is spark-fired, has no carburetor, and employs fuel injection. Cylinder gases are introduced into the fuel tank to build up enough pressure to vaporize the fuel through a needle valve. If pressure becomes too high, it is automatically shut off. Lower octane gasoline than is customarily used by ordinary gasoline engines may be used it is said, and Phillips Petroleum Co. has been assigned the patent rights.

## Lockheed Gets $7.5 Million Contract

Lockheed Aircraft Corp. has received a $7.5 million contract for the modernization of 508 P-80A Shooting Stars from the AAF. The largest of its type received by Lockheed since the end of the war, the order will give the early P-80's some of the features of the new P-80B. Included among the items to be modernized are water-alcohol fuel injection; modification of wing tips; provisions for jet-assisted take-off; attachment of rocket launchers; and provision for cockpit cooling and canopy defrosting.

(*Turn to page* 192, *please*)

# Greater Stamping Production Demands on Less "Downtime" in Press Operation




DANLY 1000-ton 4-Point Straight-Side Press

Leaders in the automotive, farm implement, electric appliance and general manufacturing fields, know that dependable, *continuous press operation* is necessary for volume stamping production.

To meet this requirement, the Danly Press is designed with a maximum safety factor wherever stress occurs. Frame construction, gearing, slide suspension, lubrication, clutch and brake assembly are designed for long life in capacity operation. Every feature of the assembly is designed for rapid maintenance and easy accessibility.

Machined to rigidly-held tolerances and properly aligned in assembly, the Danly Press in operation makes for faster runs, accurate stampings, burr-free parts and longer die life.

The Danly Pressure Oil Spray Lubrication System pipes clean filtered oil directly to each gear and driving member in the crown and slide. This system provides a clean, fresh oil supply that does not require daily attention.

Thus from the standpoints of construction, operation and maintenance, Danly Presses attack costly "*downtime,*" and ***Less Downtime Means Greater Production.***

Danly's Press Division will be glad to furnish more detailed information on any one of the presses shown here.

# DANLY

MACHINE SPECIALTIES, INC.

*2100 South 52nd Avenue • Chicago 50, Illinois*

*. . . Engineered to Specifications . . .*

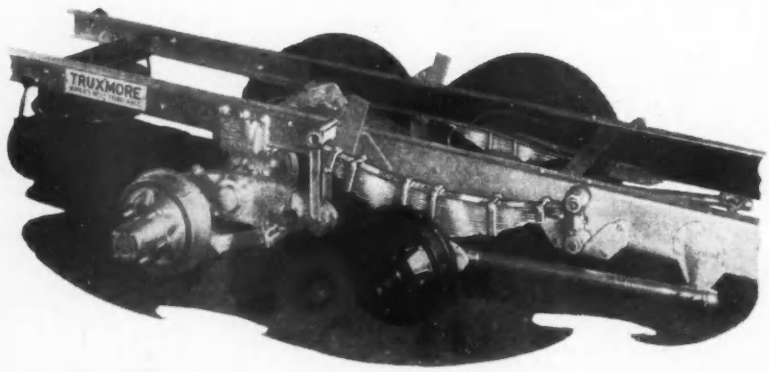
# General News

(*Continued from page* 188)

## Need Industry Help To Use German Documents

Evaluation of some 500,000 German technical documents is a project that can best be carried out jointly by industry and the Federal Government, the Department of Commerce said last week. Participation by industry, technical societies and trade associations with the Office of Technical Services, Department of Commerce, in evaluating the microfilmed documents is asked by John C. Green, OTS director. Mr. Green stated that if American firms, especially small firms, are to make full use of this technical data, the documents must first be studied, evaluated and in many cases, translated by experts. Very few firms, he said, have technical experts who can make use of the documents in their present form. OTS publishes titles of new German studies weekly in its Bibliography of Scientific and Industrial Reports.


*Larger Load Capacity...*




**TRUXMORE Third Axle**

**Fitted with TUTHILL Springs**

HERE'S how owners of 1½ and 2-ton trucks have doubled load capacities. They have installed Truxmore Third Axles, converting standard chassis into heavy duty jobs.

To carry the extra load Truxmore chose TUTHILL Springs. Here's why: Only steel measuring up to SAE high standards is used. Controlled heat treatment, plus shot-blasting, gives it perfect temper and resilience. No danger of flaws or fatigue in TUTHILL Springs.

***Choose from a complete line of standard leaf-type springs; or send your own detailed specifications for custom work.***

**TUTHILL SPRING CO.**
**760 W. Polk St.**
**CHICAGO 7, ILL.**

***Quality Leaf Springs for Sixty-Seven Years***


## Tire Shipments Up 18.5% in First Six Mos.

An increase of 18.52% in shipments by manufacturers of passenger car tires in the first six months of 1947 as against the same period last year was reported recently by the Rubber Manufacturers Association, Inc. In the first half of this year, 36,323,946 tires were shipped as opposed to 30,648,535 in the first six months of 1946.

## SKF's Hornell Plant To Operate Sept. 1

Scheduled to begin operations about September 1, new plant facilities at Hornell, N. Y., will enable SKF Industries, Inc., to increase pillow block output 80 per cent at peak operation. Part of a two-year $4 million expansion and modernization program, the transfer to Hornell of the company's cast iron department and of the bearing retainer department to Shippensburg, Pa., is primarily designed to increase spherical roller bearing production by 50 per cent at SKF's two Philadelphia plants.

## Foolproof Control for Hamilton-Standard Propellers

A new boost for airline safety was seen in the recent announcement of an improved reversible pitch propeller by Hamilton-Standard Propellers Div., United Aircraft Corp., featuring a control which makes it impossible for the pilot to reverse the pitch inadvertently.

## See Ford Shift From Coal for Power

It is reported that Ford Motor Co. is undertaking a program aimed at converting its power plant from coal to oil and natural gas. One company spokesman said that present high prices and erratic supply caused by periodic coal strikes had about convinced the company that it would be more practical to swing to some other type of fuel.

## Atlantic Div. for Pacific Airmotive Corp.

An Atlantic Div. of the Pacific Airmotive Corp. has been established at Linden, N. J. The tenth in the company's network, the new division will have full facilities for the overhaul, repair, and modification of aircraft engines of all sizes and types.

(*Turn to page* 194, *please*)

# Switch to AUTO-LITE wire & cable

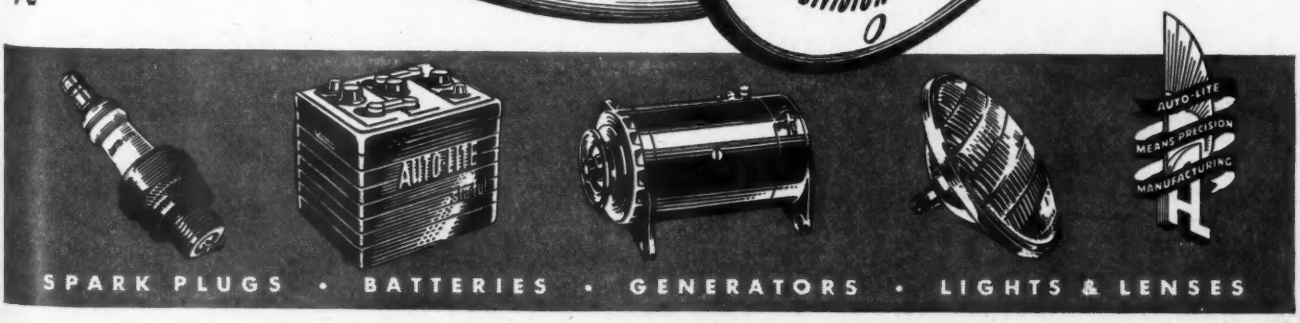
• It is natural that the organization which builds complete electrical systems for many of America's finest cars would introduce outstanding advancements in wire and cable. Typical are such products as the famous Auto-Lite Steelductor spark plug wire and Auto-Lite full gauge battery cable with anti-corrode terminals. No wonder so many industrial, marine and automotive manufacturers specify Auto-Lite wire and cable as original equipment for the products they build.

**THE ELECTRIC AUTO-LITE COMPANY**

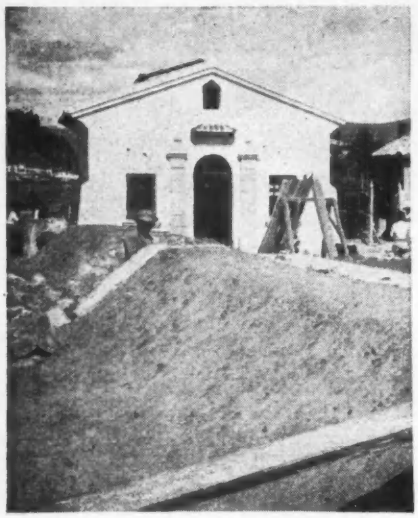
Toronto, Ontario — Toledo 1, Ohio

Money cannot buy better wire and cable

CBS Tune in the Auto-Lite Radio Show Starring Dick Haymes—Thursday Nights, 9:00 P.M. —E.T. on Columbia Broadcasting System




SPARK PLUGS • BATTERIES • GENERATORS • LIGHTS & LENSES



## *Serving the City of QUITO, ECUADOR*

In Quito, Ecuador, almost astride the equator at an elevation of over 9 thousand feet, 5 Layne Well Water units are now producing 2,280,000 gallons of water per day. Highly pleased with the proven efficiency, low operating cost and outstanding quality, Quito's city officials have just ordered another 5 Layne Wells and Pumps for another section of the city.

Designed and installed by U.S. trained engineers, Quito's complete Well Water Supply will be equal in every way to the finest on the North American Continent.

Layne Well Water Systems are universally favored the world over. They are designed and built to give the utmost in long life and operating satisfaction. Layne has many such installations in the Latin American countries, all of which are fully measuring up to their reputation of high efficiency and low operating cost.

If your city, railroad, factory, packing plant, ice plant, or irrigation project is in need of more water where production cost per million gallons must be extremely low, you should have complete facts about Layne Well Water Systems and Layne Vertical Turbine Pumps. For literature, address

**LAYNE & BOWLER, INC.**
General Offices, Memphis 8, Tennessee

- **pumps for wells, lakes, rivers, reservoirs, irrigation—or for any use where large quantities of water must be produced at low cost. Sizes range from 40 to 16,000 gallons per minute. Write for Layne Pump Catalog.**

**LAYNE**
**WELL WATER SYSTEMS**
**vertical turbine pumps**

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka, Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Pacific, Inc., Seattle, Wash. ★ Layne-Texas Co., Houston, Texas ★ Layne-Western Co., Kansas City, Mo. ★ Layne-Western Co. of Minn., Minneapolis, Minn. ★ International Water Supply Ltd., London, Ont., Can. ★ Layne-Hispano Americana, S. A., Mexico, D. F.


# General News

(*Continued from page* 192)

## Obituary

### Wallace R. Campbell

Wallace R. Campbell, 65, chairman of the board and former president of the Ford Motor Co. of Canada, died on Aug. 10, 1947, at his home in Windsor, Ont., following an illness of over a year.

### Safford Kinkead Colby

Safford Kinkead Colby, 74, vice-president in charge of research and advertising for the Aluminum Co. of America, died suddenly on Aug. 4, 1947, in Pittsburgh, Pa.

### Herbert Buckman

Herbert Buckman, secretary-manager, Cleveland Automotive Trade Association for 14 years; director of annual automobile shows of Cleveland; and former editor of the *Ohio Motorist*, died on Aug. 2, 1947, after a short illness.

### Howard Haven Beatty

Howard Haven Beatty, executive assistant to the head of the Fabricating Div., Aluminum Co. of America, Pittsburgh, died on Aug. 4, 1947, in New Kensington, Pa., after a brief illness.

### Frank W. Roche

Frank W. Roche, 72, former owner and publisher of *Automobile Topics* and formerly connected with *Motor World* in the early 1900's, died on Aug. 11, 1947, at his home in Pelham Manor, N. Y.

### William J. Croswell

William J. Crosswell, 42, director of military contracts for the Curtiss-Wright Corp. during World War II, died on Aug. 14, 1947, in Buffalo, N. Y., following a brief illness.

### Paul W. Gaebelin

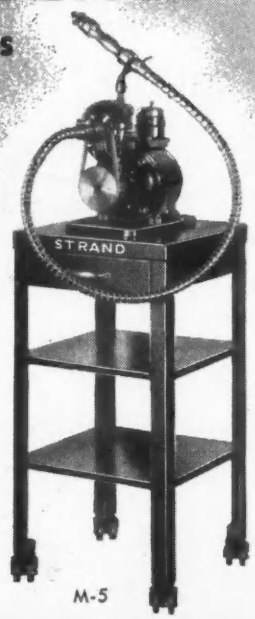
Paul W. Gaebelein, 60, vice-president and operating manager of Chrysler Motors of California, died recently.

### F. L. Dickerson

F. L. Dickerson, 49, Washington regional manager, Chrysler Div., Chrysler Corp., died recently in Washington.


**You can do any of these jobs**
**FASTER-EASIER-BETTER**
**with Strand Flexible Shaft Machines**

**Grinding · buffing · polishing · sanding**
**drilling · reaming · rotary filing · wire**
**brushing · screw driving · nut setting**
**wood filler rubbing · rasping**




Strand machines provide PORTABLE rotary power at CONSTANT speeds with dependable results and less operator fatigue. Ruggedly built for years of steady use. Hundreds of attachments easily interchanged—125 types and sizes—vertical and horizontal models from ⅛ to 3 H.P.

M-5

VISIT BOOTH 2323 ASM SHOW CHICAGO OCT. 18-24

*DISTRIBUTORS IN ALL PRINCIPAL CITIES*

Send for CATALOG showing complete line

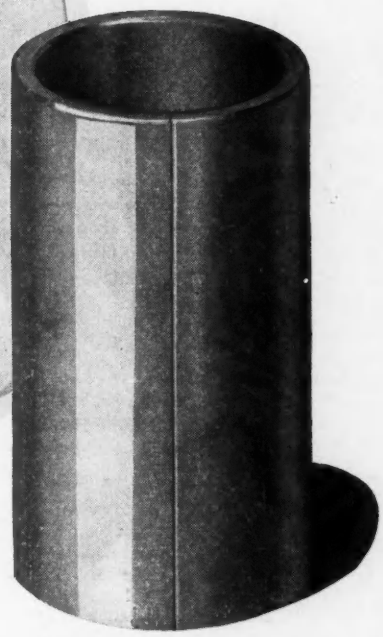
Strand FLEXIBLE SHAFTS

**N. A. STRAND & CO.**
5002 NO. WOLCOTT AVE.
CHICAGO 40, ILL.

*a typical example of how*

# THE FORMETAL */()** means lower costs to you

## the Bushing that saved $16,800



*to get your product really rolling... use*

# FORMETAL

*Superformed*

**BUSHINGS AND BEARINGS**

**The *Improved Quality of Formetal "Superformed" Bushings and Bearings gives you better performance at real dollar savings.**

**For example, an automotive parts manufacturer replaced the ordinary bushings he was using with Formetal Bushings made to his specifications. Now he not only secures better performance, but his savings on bushing costs alone are over $16,800 annually.**

**The exclusive method by which Formetal Superformed Bushings and Bearings are manufactured gives them qualities that ordinary bushings do not have. They can provide a higher Rockwell hardness without loss of machinability. A thinner wall often will give the same strength as the heavy wall of an ordinary bushing. Custom-made oil grooves, to provide the proper wiping action of the oil film can be engineered to your exact need.**

**Made of bronze, steel, or an alloy to your specification, FORMETAL bushings or bearings *save you money*. It costs nothing to obtain the data that applies to your product. Write for details and a copy of free reference booklet of BUSHINGS, BEARINGS AND SPACER TUBES... you will find it extremely informative.**

National Formetal Co., Inc., 6610 Metta Ave., Cleveland 14, Ohio

Please send free copy of your reference catalog.

Name .....

Company .....

Product manufactured .....

Address .....

City and State .....

FOR V METAL

**NATIONAL FORMETAL CO., INC.**

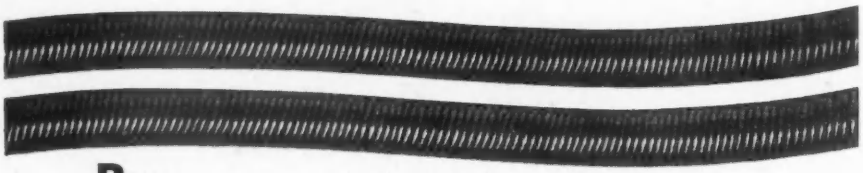
ESTABLISHED 1919

Manufacturers of "Superformed" Bushings and Bearings... and Spacer Tubes

6610 METTA AVENUE • CLEVELAND 14, OHIO

Offices in DETROIT • CHICAGO • LOS ANGELES • INDIANAPOLIS

different
AS ~~ALIKE~~
AS PEAS IN A POD



PEAS in a pod may look alike—but when you get right down to it, they're quite different.

The same is true of flexible shafts. Superficially, they all look pretty much the same. It's in service that the differences quickly show up. You'll find that S.S.White flexible shafts operate with velvety smoothness, regardless of curves—that they retain their characteristics—that they do their jobs dependably—that they have a surprisingly long service life.

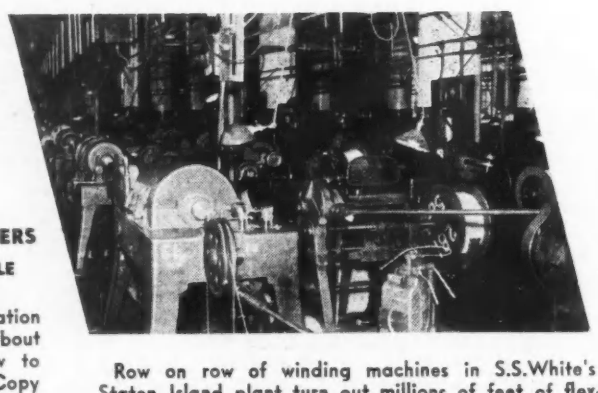
And what accounts for these differences? Well that's a long story—a story of S.S.White's more than 70 years of pioneering in the making and improving of flexible shafts. It boils down to this—S.S.White has the right answers to the factors which determine shaft characteristics and performance—such factors as—kind and grade of wire—number of layers—number and size of wires per layer—pitch of wires—tension on wires in winding—equal tension on all wires, etc., etc.

So when you need flexible shafts—either for power drive or remote control it will pay you to get them from S.S.White. By so doing you make sure of years of efficient, trouble-free flexible shaft performance. And remember also that any time you want engineering cooperation on shaft applications, it's yours without obligation. Just write us.

**FREE** TO ENGINEERS

THIS 260-PAGE FLEXIBLE SHAFT HANDBOOK

It gives full information and engineering data about flexible shafts and how to select and apply them. Copy free, if you write for it on your business letter head and mention your position.



Row on row of winding machines in S.S.White's Staten Island plant turn out millions of feet of flexible shafting annually. These machines, specially developed by S.S.White, assure accurate production of desired characteristics, uniformity throughout every length of shafting and above all *exact duplication of shafts of like specifications.*

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# Business in Brief

***Written by the Guaranty Trust Co., New York, Exclusively for*** AUTOMOTIVE INDUSTRIES

Moderate advances in general business activity are indicated. The *New York Times* index for the week ended Aug. 2 stands at 145.5, as against 144.5 for the preceding week and 137.9 a year ago.

Sales of department stores during the week ended Aug. 9, as reported by the Federal Reserve Board, equaled 222 per cent of the 1935-39 average, as compared with 220 in the week before. Sales were 3 per cent below the corresponding distribution a year earlier, as against a preceding excess of 1 per cent. The total in 1947 so far reported is 9 per cent greater than the comparable sum in 1946.

Electric power production increased slightly in the week ended Aug. 9. The output was 10.5 per cent above the corresponding amount in 1946, as compared with a like advance of 10.5 per cent shown for the preceding week.

Railway freight loadings during the same period totaled 905,244 cars, 1.8 per cent less than the figure for the week before but .07 per cent above the corresponding number recorded last year.

Crude oil production in the week ended Aug. 9 averaged 5,104,500 barrels daily, or 16,900 barrels more than the preceding average and 283,050 barrels above the comparable output in 1946.

Production of bituminous coal and lignite during the week ended Aug. 9 is estimated at 11,750,000 net tons, 1.7 per cent more than the output in the week before. The total production in 1947 so far reported is 20.2 per cent above the corresponding quantity in 1946.

Civil engineering construction volume reported for the week ended Aug. 14, according to *Engineering News-Record,* is $57,401,000, or 48 per cent less than the preceding weekly figure and 56 per cent below the comparable sum in 1946. The total recorded for thirty-three weeks of this year is 4 per cent less than the corresponding amount in 1946. Private construction is 13 per cent below that a year ago, but public construction has increased by 10 per cent.

The wholesale price index of the Bureau of Labor Statistics for the week ended Aug. 9 is 152.2 per cent of the 1926 average, as compared with 151.3 for the preceding week and 127.1 a year ago.

Member bank reserve balances increased $19,000,000 during the week ended Aug. 13. Underlying changes thus reflected include increases of $283,000,000 in Reserve bank credit and $325,000,000 in Treasury deposits with Federal Reserve banks, accompanied by an advance of $17,000,000 in money in circulation.

Total loans and investments of reporting member banks increase $150,000,000 during the week ended Aug. 6. An increase of $125,000,000 in commercial, industrial and agricultural loans was recorded. The sum of these business loans, $12,992,000,000, shows a net increase of $3,055,000,000 in twelve months.